Question 2:

On what basis is a chemical equation balanced ?

Solution :

A balanced chemical equation has equal number of atoms of different elements in the reactants and products.

Question 3:

What happens chemically when quicklime is added to water filled in a bucket ?

Solution :

When quicklime is added to water, it forms slaked lime along with evolution of heat. There will be a rise in temperature of the bucket.

Question 4:

Why should magnesium ribbon be cleaned before burning in air ?

Solution :

Magnesium ribbon should be cleaned before burning in air to remove the protective layer of basic magnesium carbonate from it's surface.

Question 5:

State whether the following statement is true or false :

A chemical equation can be balanced easily by altering the formula of a reactant or product.

Solution :

False.

Question 6:

What is wrong with the following chemical equation ?

$Mg + O \longrightarrow MgO$

Correct and balance it.

Solution :

Oxygen should be in molecular form, O_2

$2Mg + O_2 \longrightarrow 2MgO$

Question 7:

What does the symbol (aq) represent in a chemical equation ?

Solution :

The symbol (aq) represents aqueous solution in a chemical equation.

Question 8:

Why is photosynthesis considered an endothermic reaction ?

Solution :

Photosynthesis is an endothermic reaction because sunlight energy is absorbed by green plants during this process.

Question 9:

How will you indicate the following effects in a chemical equation ?

(a) A solution made in water

(b) Exothermic reaction

(c) Endothermic reaction

Solution :

(a) Aqueous solution is indicated by the symbol 'aq'.

An exothermic reaction is indicated by writing "+Heat" or "+heat energy" or "+Energy" on the products side of an equation.

An endothermic reaction is indicated by writing "+Heat" or "+Heat energy" or "+Energy" on the reactants side of an equation.

Question 10:

Translate the following statements into chemical equations and then balance the equations :

(a) Hydrogen sulphide gas burns in air to give water and sulphur dioxide.

(b) Phosphorus burns in oxygen to give phosphorus pentoxide.

(c) Carbon disulphide burns in air to give carbon dioxide and sulphur dioxide.

(d) Aluminium metal replaces iron from ferric oxide, Fe_2O_3, giving aluminium oxide and iron.

(e) Barium chloride reacts with zinc sulphate to give zinc chloride and barium sulphate.

Solution :

(a) $2H_2S + 3O_2 \longrightarrow 2H_2O + 2SO_2$

(b) $P_4 + 5O_2 \longrightarrow 2P_2O_5$

(c) $CS_2 + 3O_2 \longrightarrow CO_2 + 2SO_2$

(d) $2Al + Fe_2O_3 \longrightarrow Al_2O_3 + 2Fe$

(e) $BaCl_2 + ZnSO_4 \longrightarrow ZnCl_2 + BaSO_4$

Question 11:

Write the balanced chemical equations for the following reactions :

(a) Calcium hydroxide + Carbon dioxide ~~~~ > Calcium carbonate + Water

(b) Aluminium + Copper chloride ~~~~ > Aluminium chloride + Copper

Solution :

(a) $Ca(OH)_2 + CO_2 \longrightarrow CaCO_3 + H_2O$

(b) $2Al + 3CuCl_2 \longrightarrow 2AlCl_3 + 3Cu$

Question 12:

Complete and balance the following equations :

(a) NaOH + ... ~~~> $Na_2SO_4 + H_2O$

(b) $Ca(OH)_2$ + ... ~~~> $CaCO_3 + H_2O$

Solution :

(a) $2NaOH + H_2SO_4 \longrightarrow Na_2SO_4 + 2H_2O$

(b) $Ca(OH)_2 + CO_2 \longrightarrow CaCO_3 + H_2O$

Question 13:

Correct and balance the following equations :

a. $Ca + H_2O \rightarrow CaOH + H$

b. $N + H \rightarrow NH_3$

Solution :

a. $Ca + 2H_2O \longrightarrow Ca(OH)_2 + H_2$

b. $N_2 + 3H_2 \longrightarrow 2NH_3$

Question 14:

Write complete balanced equations for the following reactions :

(a) Calcium (solid) + Water (liquid) ~~~> Calcium hydroxide (solution) + Hydrogen (gas)

(b) Sulphur dioxide (gas) + Oxygen (gas) ~~~> Sulphur trioxide (gas)

Solution :

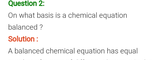
(a) $Ca\ (s) + 2H_2O(l) \longrightarrow Ca(OH)_2(aq) + H_2\ (g)$

(b) $2SO_2(g) + O_2\ (g) \longrightarrow 2SO_3(g)$

Question 15:

1. $Na + O_2 \longrightarrow Na_2O$
2. $H_2O_2 \longrightarrow H_2O + O_2$
3. $Mg(OH)_2 + HCl \longrightarrow MgCl_2 + H_2O.$
4. $Fe + O_2 \longrightarrow Fe_2O_3$
5. $Al(OH)_3 \longrightarrow Al_2O_3 + H_2O$
6. $NH_3 + CuO \longrightarrow Cu + N_2 + H_2O$
7. $Al_2(SO_4)_3 + NaOH \longrightarrow Al(OH)_3 + Na_2SO_4$
8. $HNO_3 + Ca(OH)_2 \longrightarrow Ca(NO_3)_2 + H_2O$
9. $NaOH + H_2SO_4 \longrightarrow Na_2SO_4 + H_2O$
10. $BaCl_2 + H_2SO_4 \longrightarrow BaSO_4 + HCl$

Solution :



1. $Na + O_2 \longrightarrow Na_2O$
2. $2H_2O_2 \longrightarrow 2H_2O + O_2$
3. $Mg(OH)_2 + 2HCl \longrightarrow MgCl_2 + 2H_2O.$
4. $4Fe + 3O_2 \longrightarrow 2Fe_2O_3$
5. $2Al(OH)_3 \longrightarrow Al_2O_3 + 3H_2O$
6. $2NH_3 + 3CuO \longrightarrow 3Cu + N_2 + 3H_2O$
7. $Al_2(SO_4)_3 + 6NaOH \longrightarrow 2Al(OH)_3 + 3Na_2SO_4$
8. $2HNO_3 + Ca(OH)_2 \longrightarrow Ca(NO_3)_2 + 2H_2O$
9. $2NaOH + H_2SO_4 \longrightarrow Na_2SO_4 + 2H_2O$
10. $BaCl_2 + H_2SO_4 \longrightarrow BaSO_4 + 2HCl$

Question 16:

Fill in the following blanks with suitable words :

(a) Chemical equations are balanced to satisfy the law of.....

(b) A solution made in water is known as its..... solution and indicated by the symbol.....

Solution :

(a) Conservation of mass

(b) Aqueous; (aq)

Question 17:

(a) Give one example of a chemical reaction.

(b) State two characteristics of the chemical reaction which takes place when dilute sulphuric acid is poured over zinc granules.

(c) Give two characteristics of the chemical reaction which occurs on adding potassium iodide solution to lead nitrate solution.

Solution :

(a) Magnesium Ribbon is heated in the presence of air to form a white powder called magnesium oxide.

(b) When dilute sulphuric acid is poured over zinc granules

1. there will be a rise in temperature
2. evolution of hydrogen gas.

(c)

1. A yellow precipitate is formed.
2. There will be a change in color (from colourless to yellow).