



EXERCISE

Question 1.

- (a) Define chemical reaction.
- (b) What is a chemical equation?
- (c) Why do we need to balance chemical equations?

Answer:

- (a) Chemical reaction :** Any chemical change in matter which involves its transformation into one or more new substances is called a chemical reaction.
- (b) Chemical equation :** A chemical equation is the symbolic representation of a chemical reaction using the symbols and the formula of the substances involved in the reaction.
- (c)** A chemical equation needs to be balanced so as to make the number of the atoms of the reactants equal to the number of the atoms of the products.

Question 2.

State four conditions necessary for chemical reactions to take place.

Answer:

Conditions necessary for chemical reactions :

1. Close contact
2. Solution form
3. Heat
4. Light
5. Catalyst

3. Differentiate between :

(a) Reactants and products.

Reactants	Products
1. The substances that react with one another are called reactants.	1. The new substances formed are called products.
2. Reactants are written on the left hand side of equation.	2. Products are written on the right hand side of equation.

(b) Chemical reaction and chemical equation.

Chemical reaction	Chemical Equation
Any chemical change in matter which involves its transformation into one or more new substances is called a chemical reaction.	A chemical equation is the symbolic representation of a chemical reaction using the symbols and the formula of the substances involved in the reaction.

(c) A balanced and a skeletal chemical equation.



(c) A balanced and a skeletal chemical equation.

Balanced Equation	Skeletal Equation
A balanced chemical equation is one in which the number of atoms each element on the reactant side is equal to the number of atoms of that element on the product side.	In a skeletal equation the number of atoms on reactant side are not equal to number of atoms of product side.

Question 4.

Write word equations for the following skeletal equations:

- (a) $\text{KClO}_3 \rightarrow \text{KCl} + \text{O}_2$
- (b) $\text{Zn} + \text{HCl} \rightarrow \text{ZnCl}_2 + \text{H}_2$
- (c) $\text{FeCl}_2 + \text{Cl}_2 \rightarrow \text{FeCl}_3$
- (d) $\text{CO} + \text{O}_2 \rightarrow \text{CO}_2$
- (e) $\text{Ca} + \text{O}_2 \rightarrow \text{CaO}$
- (f) $\text{Na} + \text{O}_2 \rightarrow \text{Na}_2\text{O}$
- (g) $\text{NaOH} + \text{H}_2\text{SO}_4 \rightarrow \text{Na}_2\text{SO}_4 + \text{H}_2\text{O}$
- (h) $\text{AgBr} \rightarrow \text{Ag} + \text{Br}_2$
- (i) $\text{KNO}_3 \rightarrow \text{KNO}_2 + \text{O}_2$

Answer:

- (a) $2\text{KClO}_3 \rightarrow 2\text{KCl} + 3\text{O}_2$
- (b) $\text{Zn} + 2\text{HCl} \rightarrow \text{ZnCl}_2 + \text{H}_2$
- (c) $2\text{FeCl}_2 + \text{Cl}_2 \rightarrow 2\text{FeCl}_3$
- (d) $2\text{CO} + \text{O}_2 \rightarrow 2\text{CO}_2$
- (e) $2\text{Ca} + \text{O}_2 \rightarrow 2\text{CaO}$
- (f) $4\text{Na} + \text{O}_2 \rightarrow 2\text{Na}_2\text{O}$
- (g) $2\text{NaOH} + \text{H}_2\text{SO}_4 \rightarrow \text{Na}_2\text{SO}_4 + 2\text{H}_2\text{O}$
- (h) $2\text{AgBr} \rightarrow 2\text{Ag} + \text{Br}_2$
- (i) $2\text{KNO}_3 \rightarrow 2\text{KNO}_2 + \text{O}_2$

Question 5.

Balance the following chemical equations :

- (a) $\text{FeS} + \text{HCl} \rightarrow \text{FeCl}_2 + \text{H}_2\text{S}$
- (b) $\text{Na}_2\text{CO}_3 + \text{HCl} \rightarrow \text{NaCl} + \text{H}_2\text{O} + \text{CO}_2$
- (c) $\text{H}_2 + \text{O}_2 \rightarrow \text{H}_2\text{O}$
- (d) $\text{Na}_2\text{O} + \text{H}_2\text{O} \rightarrow \text{NaOH}$

Answer:

- (a) $\text{FeS} + 2\text{HCl} \rightarrow \text{FeCl}_2 + \text{H}_2\text{S}$
- (b) $\text{Na}_2\text{CO}_3 + 2\text{HCl} \rightarrow 2\text{NaCl} + \text{H}_2\text{O} + \text{CO}_2$
- (c) $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$
- (d) $\text{Na}_2\text{O} + \text{H}_2\text{O} \rightarrow 2\text{NaOH}$

Question 6.

What information do you get from the equation $\text{H}_2 + \text{Cl}_2 \rightarrow 2\text{HCl}$?

Answer:

- (a) Hydrogen and chlorine molecules are the reactants.
- (b) They are in gaseous form.
- (c) The product is hydrogen chloride gas.
- (d) Two molecules of hydrogen chloride are formed.

Question 7.

Write your observations for the following chemical reactions and name the products formed :



Question 7.

Write your observations for the following chemical reactions and name the products formed :

- (a) When sugar is heated.
- (b) When manganese dioxide is added to potassium chlorate and heated.
- (c) When dilute acetic acid is poured on baking soda.
- (d) When an aqueous solution of sodium chloride is mixed with an aqueous solution of silver nitrate.
- (e) When ammonium chloride is heated with sodium hydroxide.
- (f) When water is added to quick lime?

Answer:

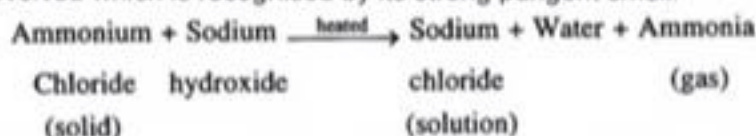
(a) Black solid mass (charcoal) is formed along with water vapours.

(b) Manganese dioxide acts as a catalyst for the decomposition of potassium chlorate into potassium chloride and oxygen at a lower temperature.

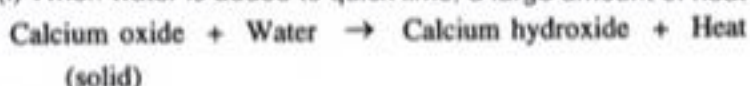
(c) Sodium acetate, CO_2 and water is formed.

(d) A white insoluble solid precipitate of silver chloride is formed along with Sodium nitrate.

(e) When solid ammonium chloride is heated with sodium hydroxide solution, a gas ammonia is evolved which is recognised by its strong pungent smell.



(f) When water is added to quick lime, a large amount of heat energy is evolved.



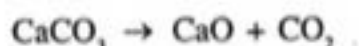
Question 8.

Write symbolic representation for the following word equations and balance them :

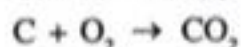
- (a) Calcium carbonate \rightarrow Calcium oxide + Carbon dioxide
- (b) Carbon + Oxygen \rightarrow Carbon dioxide
- (c) Calcium oxide + Water \rightarrow Calcium hydroxide
- (d) Aluminium + Chlorine \rightarrow Aluminium chloride
- (e) Iron + Sulphur \rightarrow Iron sulphide

Answer:

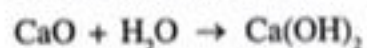
(a) Calcium carbonate \rightarrow Calcium oxide + Carbon dioxide



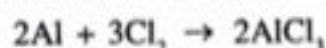
(b) Carbon + Oxygen \rightarrow Carbon dioxide



(c) Calcium oxide + Water \rightarrow Calcium hydroxide



(d) Aluminium + Chlorine \rightarrow Aluminium chloride



(e) Iron + Sulphur \rightarrow Iron sulphide

