

Exercise :2 B

Complete the following statements.

- The chemical change involving iron and hydrochloric acid illustrates a..... reaction.
- In the type of reaction called... two compounds exchange their positive and negative radicals.
- A catalyst either or the rate of a chemical change but itself remains... at the end of the reaction.
- On heating, hydrated copper sulphate changes its colour from to

Solution:

- The chemical change involving iron and hydrochloric acid illustrates a **Displacement** reaction.
- In the type of reaction called **double displacement** two compounds exchange their positive and negative radicals.
- A catalyst either **Accelerate** or **decelerates** the rate of a chemical change but itself remains **unaffected** at the end of the reaction.
- On heating, hydrated copper sulphate changes its colour from **blue** to **white**.

2. When hydrogen burns in oxygen, water is formed; when electricity is passed through water, hydrogen and oxygen are given out. Name the type of chemical changes involved in the two cases.

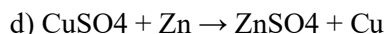
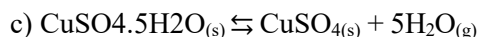
Solution:

Answer is combination reaction

3. Explain, giving one example for each of the following chemical changes:

- Double decomposition
- Thermal dissociation
- Reversible reaction
- Displacement

Solution:

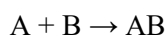


4. (a) What is synthesis ?

(b) What kind of chemical reaction is synthesis? Support your answer by an example.

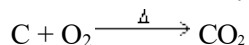
Solution:

a) A reaction in which two or more substances combine together to form a single substance is called a synthesis or combination reaction.



b) Synthesis is a combination reaction.

In the above reaction, substances A and B combine to give a molecule of a new substance, AB.
Carbon burns in oxygen to form a gaseous compound, carbon dioxide.



5. Decomposition brought about by heat is known as thermal decomposition. What is the difference between thermal dissociation and thermal decomposition.

Solution:

A decomposition reaction brought about by heat is known as thermal decomposition.

A simultaneous reversible decomposition reaction brought about only by heat is thermal dissociation.

6. (a) Define neutralization reaction with an example.

(b) Give a balanced equation for this reaction.

(c) Give three applications of neutralization reactions.

Solution:

a) Neutralization reaction is a reaction between an acid and a base which results in the formation of salt and water.

Ex: $\text{NaOH} + \text{HCl} \rightarrow \text{NaCl} + \text{H}_2\text{O}$.

b) $\text{NaOH} + \text{HCl} \rightarrow \text{NaCl} + \text{H}_2\text{O}$ is a balanced equation

c) Applications of neutralization reactions are as follows

- When someone is stung by a bee, formic acid enters the skin and causes pain, which can be relieved by rubbing the spot with slaked lime or baking soda, both of which are bases.
- Acid which is accidentally spilled on to our clothes can be neutralised with ammonia solution.
- If soil is somewhat acidic and thus unfavourable for growing of certain crops, slaked lime is added to neutralise the excess acid.

7. What do you understand by precipitation reaction? Explain with an example.

Solution:

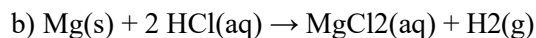
Precipitation is a reaction in which two compounds in liquid state react to form an insoluble salt as one of the products. This product is known as precipitate.

Ex: $\text{AgNO}_3(\text{aqueous}) + \text{KCl}(\text{aqueous}) \rightarrow \text{AgCl}(\text{precipitate}) + \text{KNO}_3(\text{aqueous})$

8. (a) What are double displacement reactions ? (b) Give an example of double displacement reaction, where a gas is evolved.

Solution:

a) Double displacement reactions are those in which two compounds in a solution reacts to form two new compounds by mutual exchange of radicals. This type of reaction is also known as double decomposition reaction.



9. (a) What is a decomposition reaction ?

(b) Decomposition reactions can occur by (i) heat (ii) electricity and (iii) sunlight.

Give two balanced reactions for each.

Solution:

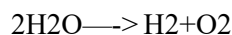
a) Reaction in which a compound splits into two or more simpler substances is called decomposition reaction.

b)

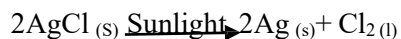
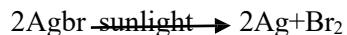
i) Heat



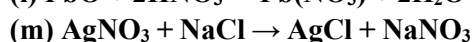
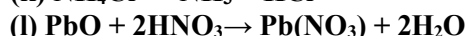
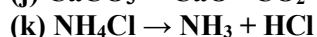
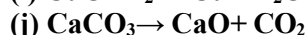
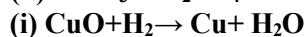
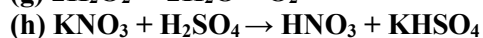
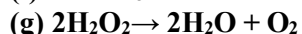
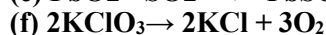
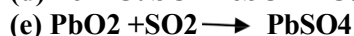
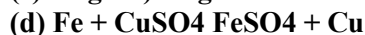
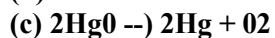
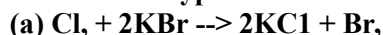
ii) Electricity



iii) Light



10. State the type of reactions each of the following represent and balance the ones that are not balanced.



Solution:

- a) Displacement reaction
 b) Neutralisation reaction
 c) Decomposition reaction
 d) Displacement reaction
 e) Combination reaction
 f) Decomposition reaction
 g) Decomposition reaction
 h) Double decomposition reaction
 i) Displacement reaction
 j) Decomposition reaction
 k) Decomposition reaction
 l) Neutralisation reaction
 m) Double decomposition reaction

11. Match the following

a. $\text{Zn}(\text{s}) + \text{H}_2\text{SO}_4(\text{aq}) \rightarrow \text{ZnSO}_4(\text{aq}) + \text{H}_2(\text{g})$	i) Photochemical decomposition
b. $2\text{AgCl}(\text{s}) \xrightarrow{\text{sunlight}} 2\text{Ag}(\text{s}) + \text{Cl}_2(\text{g})$	ii) Thermal decomposition
c. $2\text{KCl} \xrightarrow{\text{electricity}} 2\text{K} + \text{Cl}_2$	iii) Displacement reaction
d. $2\text{Hg}(\text{s}) \xrightarrow{\Delta} 2\text{HgS} + \text{O}_2$	iv) Electrolytic decomposition

Solution:

a. $\text{Zn}(\text{s}) + \text{H}_2\text{SO}_4(\text{aq}) \rightarrow \text{ZnSO}_4(\text{aq}) + \text{H}_2(\text{g})$	iii) Displacement reaction
b. $2\text{AgCl}(\text{s}) \xrightarrow{\text{sunlight}} 2\text{Ag}(\text{s}) + \text{Cl}_2(\text{g})$	i) Photochemical decomposition
c. $2\text{KCl} \xrightarrow{\text{electricity}} 2\text{K} + \text{Cl}_2$	iv) Electrolytic decomposition
d. $2\text{Hg}(\text{s}) \xrightarrow{\Delta} 2\text{HgS} + \text{O}_2$	ii) Thermal decomposition

12. Multiple choice:

a. Which of the following is not a characteristic of a chemical change?

- i. It is irreversible.
- ii. No net energy change is involved.
- iii. New substance is formed.
- iv. Involves absorption or liberation of energy.

b. A reaction of a type: $AB + CD \rightarrow AD + CD$, involves

- i. No chemical change
- ii. Decomposition of AB and CD
- iii. Exchange of ions of AB and CD
- iv. Combination of AB and CD

c. The reaction $BaCl_2(aq) + H_2SO_4(aq) \rightarrow BaSO_4(s) + 2HCl(aq)$ is

- i. Displacement reaction
- ii. Neutralisation reaction
- iii. Decomposition reaction
- iv. Double displacement reaction

d. Thermal decomposition of sodium carbonate will produce

- i. Carbon dioxide
- ii. Oxygen
- iii. Sodium hydroxide
- iv. No other product

Solution:

- a) ii. No net energy change is involved.
- b) iii. Exchange of ions of AB and CD
- c) iv. Double displacement reaction
- d) i. Carbon dioxide

