

SOLVED QUESTIONS

1. Multiple choice questions: (Tick the correct option).

1. The reaction between magnesium and oxygen is:

- (a) an endothermic reaction
- (b) an exothermic reaction
- (c) a catalysed reaction
- (d) a reversible reaction

2. Which reaction represents chemical combination?

- (a) $2\text{NaHCO}_3 \rightarrow \text{Na}_2\text{CO}_3 + \text{H}_2\text{O} + \text{CO}_2$
- (b) $\text{CaO} + \text{H}_2\text{O} \rightarrow \text{Ca}(\text{OH})_2$
- (c) $\text{CuSO}_4 + \text{Fe} \rightarrow \text{FeSO}_4 + \text{Cu}$
- (d) $\text{AgNO}_3 + \text{NaCl} \rightarrow \text{AgCl} + \text{NaNO}_3$

3. Which of the following reactions does not take place?

- (a) $\text{FeSO}_4 + \text{Cu} \rightarrow \text{CuSO}_4 + \text{Fe}$
- (b) $\text{Zn} + 2\text{HCl} \rightarrow \text{ZnCl}_2 + \text{H}_2$
- (c) $\text{Pb}(\text{NO}_3)_2 + \text{Mg} \rightarrow \text{Mg}(\text{NO}_3)_2 + \text{Pb}$
- (d) $\text{ZnSO}_4 + \text{Mg} \rightarrow \text{MgSO}_4 + \text{Zn}$

4. An atom or a group of atoms is said to be an oxidising agent if it

- (a) loses electrons
- (b) gains electrons
- (c) neither loses nor gains electrons
- (d) none of the above

5. Which one is not a biochemical catalyst?

- (a) Chlorophyll
- (b) Pepsin
- (c) Manganese dioxide
- (d) Amylase

Ans

1. (b) 2. (b) 3. (a) 4. (b) 5. (c)

2. Fill in the blanks with appropriate words

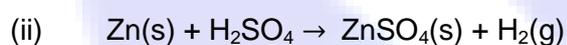
- 1. The presence of impurity causes a in the melting point of a substance.
- 2. The boiling point of a pure liquid at a particular pressure remains
- 3. Impure water is distilled to obtain pure water in the laboratory by
- 4. The process of a liquid changing into a solid is called

5. The temperature, at which a solid changes into a liquid, is called its
6. A change, which alters the composition of a substance, is known as a change.
7. There is no change in the of the substance during a physical change.
8. The reaction in which energy is involved is called a
9. The boiling point of a pure liquid with the decrease in pressure.
10. When a solid changes to a liquid on melting the remains constant.

.Ans

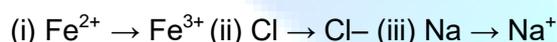
1. decrease 2. constant 3. distillation 4. Freezing 5. melting point
 6. chemical 7. mass 8. chemical change 9. decreases 10. Mass

3. Classify the following reactions as combination, decomposition, displacement, precipitation and neutralisation.



Ans. (i) Decomposition (ii) Displacement (iii) Precipitation

4. Classify the following as oxidation or reduction.



Ans. (i) Oxidation (ii) Reduction (iii) Oxidation

5. Give reasons for the following

1. The melting point of ice formed from tap water is not 0°C.

Ans.

The presence of impurities causes a decrease in the melting point of a substance. Tapwater contains salts and gases dissolved in it. Therefore, melting point of ice formed from tapwater is not 0°C.

2. Why does ice under a skater's shoes melt?

Ans.

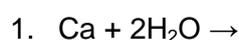
The melting point of a solid decreases with increase in pressure. Increase in pressure causes a rise in temperature. Therefore, ice melts under a skaters shoes.

3. The reaction between an acid and a base to form salt and water is a double displacement reaction.

Ans.

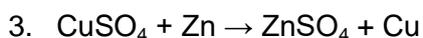
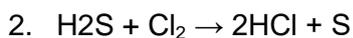
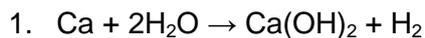
When an acid reacts with a base, they mutually exchange their radicals to form two new products – salt and water. Therefore, the above reaction is a double displacement reaction.

6. Complete the following equations.





Ans



7. Answer the following questions

1. Give one example each, which illustrates the following characteristics of a chemical reaction:

- (i) evolution of a gas
- (ii) change of colour
- (iii) formation of a precipitate.

Ans.

- (i) When calcium carbonate is heated strongly, it decomposes to form calcium oxide and gives off carbon dioxide gas. $\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$
- (ii) When green coloured crystals of copper carbonate are strongly heated, it decomposes to form black coloured copper oxide and gives off carbon dioxide gas. $\text{CuCO}_3 \rightarrow \text{CuO} + \text{CO}_2$ (green) (black)
- (iii) When colourless solution of lead nitrate is mixed with colourless potassium iodide solution, a yellow coloured precipitate of lead iodide is obtained. $\text{Pb}(\text{NO}_3)_2 + 2\text{KI} \rightarrow 2\text{KNO}_3 + \text{PbI}_2$

2. By giving one example, explain what do you understand by the following terms?

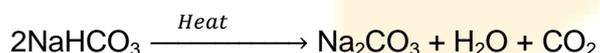
- (i) Exothermic reactions
- (ii) Endothermic reactions

Ans.

- (i) The chemical reactions in which heat energy is released are called exothermic reactions. When magnesium is heated it catches fire and burns with a dazzling white light and releases a lot of heat.



- (ii) The chemical reactions in which heat energy is absorbed are called endothermic reactions. On heating, sodium bicarbonate swells up to form sodium carbonate, steam and carbon dioxide gas.



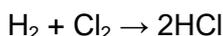
3. (i) Define a chemical reaction.

- (ii) Define the term chemical combination. Support your answer by two examples.

Ans.

- (i) When one or more substances undergo a chemical change with the absorption or release of energy and they form one or more new products, the change is known as a chemical change.

- (ii) When two or more elements or compounds combine chemically to form one new product only, the reaction is known as chemical combination.



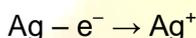
4. (i) What do you understand by the term electroplating?
(ii) State two reasons for electroplating an article.
(iii) Briefly describe how you will electroplate a brass cup with silver.

Ans.

- (i) The process of depositing a thin and compact layer of a superior metal over an inferior metal by the process of electrolysis is called electroplating.
(ii) (a) To prevent iron or steel articles from rusting.
(b) To improve the appearance of articles.
(iii) The brass cup is made the cathode, pure silver rod the anode and sodium silver cyanide the electrolyte while silver plating the brass cup. Electrolyte: The electrolyte ionises as $\text{NaAg}(\text{CN})_2 \rightleftharpoons \text{Na}^+ + \text{Ag}^+ + 2\text{CN}^-$

Reaction at the cathode: Silver ions migrate towards the cathode. Here they accept electrons from the cathode to form silver atoms, which deposit on the article. $\text{Ag}^+ + \text{e}^- \rightarrow \text{Ag}$

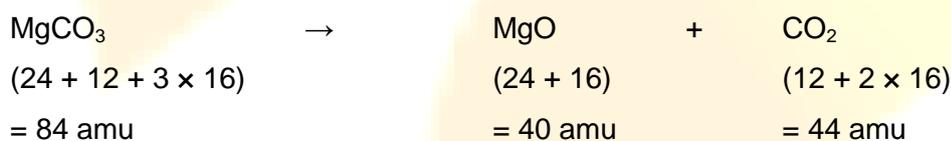
Reaction at the anode: Silver atoms ionise by losing electrons to the anode and hence, form silver ions. These silver ions then enter the electrolyte.



8. Calculate the amount of magnesium oxide formed and carbon dioxide liberated when 4.2 g of magnesium carbonate decomposes on strong heating.

[Mg = 24, C = 12, O = 16]

Ans.



84 amu of MgCO_3 forms

40 amu of MgO

4.2 g of MgCO_3 forms

$$\frac{40 \times 4.2}{84} = 2 \text{ g of MgO}$$

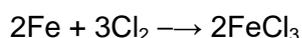
84 amu of MgCO_3 liberates

44 amu of CO_2

4.2 g of MgCO_3 liberates

$$\frac{44 \times 4.2}{84} = 2.2 \text{ g of CO}_2$$

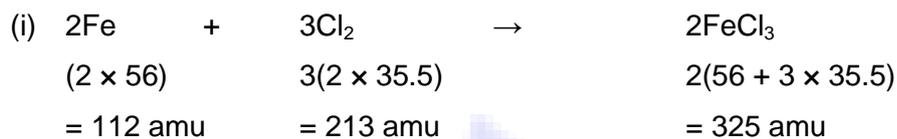
9. 7.1 g of chlorine reacts completely with iron as shown under.



Calculate

- (i) wt. of iron required
(ii) wt. of ferric chloride formed. [Fe = 56, Cl = 35.5]

Ans.



213 amu of Cl_2 combines with 112 amu of Fe

7.1 g of Cl_2 combines with $\frac{112 \times 7.1}{213}$ g of Fe = 3.73 g

(ii) 213 amu of Cl_2 forms 325 amu of FeCl_3

7.1 amu of Cl_2 forms $\frac{325 \times 7.1}{213} = 10.83$ g of FeCl_3

10. Differentiate between irreversible and reversible reactions.

Ans.

Irreversible reaction	Reversible reaction
(i) In this type of reaction only a part of the reactants get converted into products. After a certain stage, the products start converting back into reactants.	(i) In this type of reactions complete conversion of reactants into products take place.
(ii) The reaction proceeds in both the forward and backward direction.	(ii) The reaction proceeds in the forward direction only.