CHEMICAL REACTION AND EQUATION

IMPORTANT MCQ FOR BOARD EXAM

1. **Identify 'x', 'y' and 'z' in the following reaction : (2020)**

$$2KClO_{3(x)} \xrightarrow{y} 2KCl_{(x)} + O_{2(z)}$$

(a) x = gas; y = reaction condition; z = gas

(b) x = solid; y = liquid; z = gas

(c) x = number of moles of $KClO_3$; y = reaction condition; z = number of molecules of oxygen

(d) x = physical state of $KClO_3$ and KCl;

Where y = reaction condition, z = physical state of O_2.

2. **Assertion (A) : Following is a balanced chemical equation for the action of steam on iron : $3Fe + 4H_2O \rightarrow Fe_3O_4 + 4H_2$ (2020)**

   Reason (R): The law of conservation of mass holds good for a chemical equation.

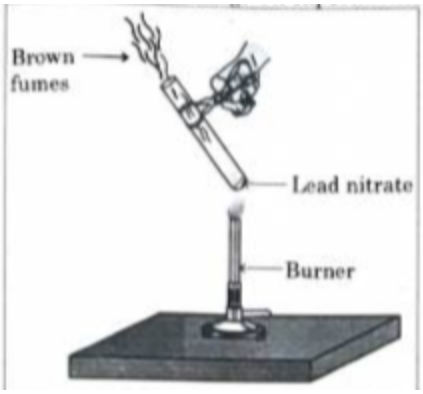
(a) Both (A) and (R) are true and reason (R) is the correct explanation of the assertion (A)

(b) Both (A) and (R) are true, but reason (R) is not the correct explanation of the assertion (A).

(c) (A) is true, but (R) is false.

(d) (A) is false, but (R) is true.

3. **The emission of brown fumes in the given experimental set-up is due to Brown fumes.[2023]**



(a) thermal decomposition of lead nitrate which produces brown fumes of nitrogen dioxide.

(b) thermal decomposition of lead nitrate which produces brown fumes of lead oxide.

(c) oxidation of lead nitrate forming lead oxide and nitrogen dioxide.

(d) oxidation of lead nitrate forming lead oxide and oxygen.

4.

In the reaction $MnO_2 + 4HCl \rightarrow MnCl_2 + 2H_2O + Cl_2$:

1. MnO_2 is reduced to $MnCl_2$
2. MnO_2 is oxidized to $MnCl_2$
3. $MnCl_2$ is reduced to MnO_2
4. Mn does not undergo redox reaction

5. **Which of the following statements about the given reaction are correct?**
3Fe (s) + 4H2O (g) → Fe3O4 (s) + 4 H2 (g)

(i) Iron metal is getting oxidised
(ii) Water is getting reduced
(iii) Water is acting as reducing agent
(iv) Water is acting as oxidising agent

(a) (i), (ii) and (iii)
(b) (in) and (iv)
(c) (i), (ii) and (iv)
(d) (ii) and (iv)

6. **Which of the following are exothermic processes?**
(i) Reaction of water with quick lime
(ii) Dilution of an acid
(iii) Evaporation of water
(iv) Sublimation of camphor (crystals)

(a) (i) and (ii)
(b) (ii) and (iii)

(c) (i) and (iv)
(d) (ii) and (iv)

7. **Electrolysis of water is a decomposition reaction. The mole ratio of hydrogen and oxygen gases liberated during electrolysis of water is:**
   (a) 1: 1 (b) 2:1
   (c) 4:1 (d) 1:2

8.**The following reaction is an example of a $4NH_3(g) + 5O_2(g) \rightarrow 4NO(g) + 6H_2O(g)$**

(i) displacement reaction

(ii) combination reaction

(iii) redox reaction

(iv) neutralisation reaction

(a) (i) and (iv)
(b) (ii) and (iii)
(c) (i) and (iii)
(d) (iii) and (iv)

9.What type of chemical reactions take place when electricity is passed through water?

(a) Displacement
(b) Combination
(c) Decomposition
(d) Double displacement

Q.10 Which of the following statements about the reaction below are incorrect?

$2PbO(s) + C(s) \longrightarrow 2Pb(s) + CO_2(g)$

1. Lead is getting reduced.

2. Carbon dioxide is getting oxidized.

3. Carbon is getting oxidized.

4. Lead oxide is getting reduced.

(a) 1 and 2
(b) 1 and 3
(c) 1, 2 and 3
(d) all of the above

Q.11. One of the following is an endothermic reaction.

(a) Combination of carbon and oxygen to form carbon monoxide
(b) Combination of nitrogen and oxygen to form nitrogen monoxide
(c) Combination of glucose and oxygen to form carbon dioxide and water.
(d) Combination of zinc and hydrochloric acid to form zinc chloride and hydrogen

Q.12 What is observed when a solution of potassium iodide is added to silver nitrate solution?

(a) No reaction takes place
(b) White precipitate of silver iodide is formed
(c) yellow precipitate of Agl is formed
(d) Agl is soluble in water.

Q 13 .Which reaction is used in photography?

(a) $CaO + H_2O \longrightarrow Ca(OH)_2 + \text{Heat}$
(b) $2FeSO_4 \xrightarrow{\text{Heat}} Fe_2O_3 + SO_2 + SO_3$
(c) $2Cu + O_2 \longrightarrow 2CuO$
(d) $2AgBr \xrightarrow{\text{sunlight}} 2Ag + Br$

Q 14.A substance 'X' is used in white-washing and is obtained by heating limestone in the absence of air. Identify 'X'.

(a) CaOCl2
(b) Ca(OH)2
(c) CaO
(d) CaCO3

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2024-PYQ QUESTION

1. When 2 mL of sodium hydroxide solution is added to few pieces of granulated zinc in a test tube and then warmed, the reaction that occurs can be written in the form of a balanced chemical equation as : **1**

(a) $NaOH + Zn \rightarrow NaZnO_2 + H_2O$

(b) $2NaOH + Zn \rightarrow Na_2ZnO_2 + H_2$

(c) $2NaOH + Zn \rightarrow NaZnO_2 + H_2$

(d) $2NaOH + Zn \rightarrow Na_2ZnO_2 + H_2O$

2. Select from the following a decomposition reaction in which source of energy for decomposition is light : **1**

(a) $2FeSO_4 \rightarrow Fe_2O_3 + SO_2 + SO_3$

(b) $2H_2O \rightarrow 2H_2 + O_2$

(c) $2AgBr \rightarrow 2Ag + Br_2$

(d) $CaCO_3 \rightarrow CaO + CO_2$

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(c) $2NaOH + Zn \rightarrow NaZnO_2 + H_2$

(d) $2NaOH + Zn \rightarrow Na_2ZnO_2 + H_2O$

3. $MnO_2 + 4HCl \rightarrow MnCl_2 + 2H_2O + Cl_2$

The reaction given above is a redox reaction because in this case : **1**

(a) MnO_2 is oxidised and HCl is reduced.

(b) HCl is oxidised.

(c) MnO_2 is reduced.

(d) MnO_2 is reduced and HCl is oxidised.

6. Identify the correct statement about the following reaction :

$$2H_2S + SO_2 \longrightarrow 2H_2O + S$$

(A) H_2S is oxidising agent and SO_2 is reducing agent.

(B) H_2S is reduced to sulphur.

(C) SO_2 is oxidising agent and H_2S is reducing agent.

(D) SO_2 is oxidised to sulphur.

2. Which one of the following reactions is different from the remaining three ? **1**

(A) $NaCl + AgNO_3 \rightarrow AgCl + NaNO_3$

(B) $CaO + H_2O \rightarrow Ca(OH)_2$

(C) $KNO_3 + H_2SO_4 \rightarrow KHSO_4 + HNO_3$

(D) $ZnCl_2 + H_2S \rightarrow ZnS + 2HCl$

7. Consider the following chemical equation : 1

$a\ Al_2O_3 + b\ HCl \longrightarrow c\ AlCl_3 + d\ H_2O$

In order to balance this Chemical equation, the values of a, b, c and d must be

(A) 1, 6, 2 and 3 (B) 1, 6, 3 and 2

(C) 2, 6, 2 and 3 (D) 2, 6, 3 and 2

5. To balance the following chemical equation, the values of the coefficients x, y and z must be respectively :

$$x\ Zn(NO_3)_2 \xrightarrow{\Delta} y\ ZnO + z\ NO_2 + O_2$$

(A) 4, 2, 2 (B) 4, 4, 2

(C) 2, 2, 4 (D) 2, 4, 2

6. Which of the following is a redox reaction, but ***not*** a combination reaction ?

(A) $C + O_2 \rightarrow CO_2$ (B) $2\ H_2 + O_2 \rightarrow 2\ H_2O$

(C) $2\ Mg + O_2 \rightarrow 2\ MgO$ (D) $Fe_2O_3 + 3\ CO \rightarrow 2\ Fe + 3\ CO_2$

5. Which of the following is a redox reaction, but ***not*** a combination reaction ?

(A) $C + O_2 \rightarrow CO_2$ (B) $2\ H_2 + O_2 \rightarrow 2\ H_2O$

(C) $2\ Mg + O_2 \rightarrow 2\ MgO$ (D) $Fe_2O_3 + 3\ CO \rightarrow 2\ Fe + 3\ CO_2$

1. A chemical reaction in which exchange of ions occurs between the reactants, is known as :

(A) Endothermic Reaction

(B) Exothermic Reaction

(C) Double Displacement Reaction

(D) Displacement Reaction

1. $Zn + 2CH_3COOH \longrightarrow (CH_3COO)_2 Zn + H_2$

The above reaction is a :

(A) Decomposition reaction (B) Displacement reaction

(C) Double displacement reaction (D) Combination reaction

2. Which one of the following reactions is different from the remaining three ? 1

(A) $NaCl + AgNO_3 \rightarrow AgCl + NaNO_3$

(B) $CaO + H_2O \rightarrow Ca(OH)_2$

(C) $KNO_3 + H_2SO_4 \rightarrow KHSO_4 + HNO_3$

(D) $ZnCl_2 + H_2S \rightarrow ZnS + 2HCl$

3. Identify the product 'X' obtained in the following chemical reaction : 1

$$CaCO_3 \xrightarrow{\Delta} 'X' + CO_2$$

(A) Quick lime (B) Gypsum

(C) Lime Stone (D) Plaster of Paris

4. Select a pair of natural indicator from the following : 1

(A) Litmus and methyl orange

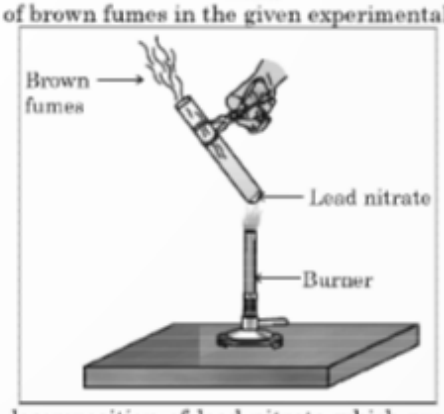
(B) Turmeric and Litmus

(C) Phenolphthalein and methyl orange

(D) Methyl orange and Turmeric

2023 PYQ

2. The emission of brown fumes in the given experimental set-up is due to 1



(a) thermal decomposition of lead nitrate which produces brown fumes of nitrogen dioxide.
(b) thermal decomposition of lead nitrate which produces brown fumes of lead oxide.
(c) oxidation of lead nitrate forming lead oxide and nitrogen dioxide.
(d) oxidation of lead nitrate forming lead oxide and oxygen.

3. $MnO_2 + x\ HCl \rightarrow MnCl_2 + y\ H_2O + z\ Cl_2$ 1

In order to balance the above chemical equation, the values of x, y and z respectively are :

(a) 6, 2, 2 (b) 4, 1, 2
(c) 4, 2, 1 (d) 2, 2, 1

1. Select the appropriate state symbols of the products given as X and Y in the following chemical equation by choosing the correct option from table given below : 1

$$Zn_{(s)} + H_2SO_{4(l)} \longrightarrow ZnSO_{4(X)} + H_{2(Y)}$$

	(X)	(Y)
(a)	(s)	(l)
(b)	(aq)	(g)
(c)	(aq)	(s)
(d)	(g)	(aq)

3. Consider the following chemical equation I and II **1**

I. $Mg + 2HCl \longrightarrow MgCl_2 + H_2$

II. $NaOH + HCl \longrightarrow NaCl + H_2O$

The correct statement about these equations is –

(a) 'I' is a displacement reaction and 'II' is a decomposition reaction.

(b) 'I' is a displacement reaction and 'II' is double displacement reaction.

(c) Both 'I' and 'II' are displacement reactions.

(d) Both 'I' and 'II' are double-displacement reactions.

1. The balanced chemical equation showing reaction between quicklime and water is :

(a) $2\,CaO + H_2O \longrightarrow 2\,CaOH + H_2 + Heat$

(b) $CaO + H_2O \longrightarrow Ca(OH)_2 + H_2 + Heat$

(c) $CaO + H_2O \longrightarrow Ca(OH)_2 + Heat$

(d) $2\,CaO + 3\,H_2O \longrightarrow 2\,Ca(OH)_3 + O_2 + Heat$

4. Study the following chemical reaction :

$$2\,Na\,(s) + 2\,H_2O\,(l) \longrightarrow 2\,NaOH\,(aq) + H_2\,(g)\uparrow$$

The reducing agent in this reaction is :

(a) Na

(b) H_2O

(c) NaOH

(d) H_2

5. In order to balance the following chemical equation, the values of the coefficients x and y respectively are :

$$x\,Pb(NO_3)_2 \xrightarrow{Heat} 2\,PbO + y\,NO_2 + O_2$$

(a) 2, 4 (b) 2, 2

(c) 2, 3 (d) 4, 2

6. When ethanol reacts with sodium two products are formed. These products are :

(a) Sodium ethanoate and oxygen

(b) Sodium ethanoate and hydrogen

(c) Sodium ethoxide and oxygen

(d) Sodium ethoxide and hydrogen

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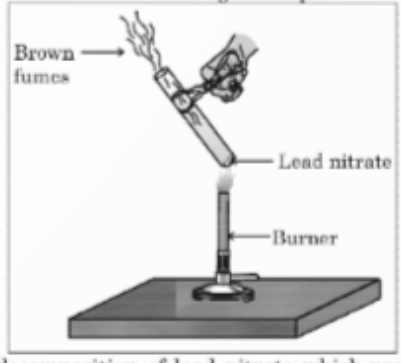

(a) thermal decomposition of lead nitrate which produces brown fumes of nitrogen dioxide.

(b) thermal decomposition of lead nitrate which produces brown fumes of lead oxide.

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4. $MnO_2 + x\ HCl \rightarrow MnCl_2 + y\ H_2O + z\ Cl_2$ **1**

In order to balance the above chemical equation, the values of x, y and z respectively are :

(a) 6, 2, 2 (b) 4, 1, 2

(c) 4, 2, 1 (d) 2, 2, 1

5. Select washing soda from the following : **1**

(a) $NaHCO_3$ (b) $Na_2CO_3.5H_2O$

(c) $Na_2CO_3.10H_2O$ (d) NaOH

5. In order to balance the following chemical equation, the values of the coefficients x and y respectively are :

$$x\ Pb(NO_3)_2 \xrightarrow{Heat} 2\ PbO + y\ NO_2 + O_2$$

(a) 2, 4 (b) 2, 2

(c) 2, 3 (d) 4, 2

6. When zinc reacts with sodium hydroxide, the product formed is :

(a) Sodium oxide (b) Sodium zincate

(c) Zinc hydroxide (d) Zinc oxide

5. Study the following chemical reaction :

$$2\ Na\ (s) + 2\ H_2O\ (l) \longrightarrow 2\ NaOH\ (aq) + H_2\ (g) \uparrow$$

The reducing agent in this reaction is :

(a) Na (b) H_2O

(c) NaOH (d) H_2

6. The balanced chemical equation showing reaction between quicklime and water is :

(a) $2\ CaO + H_2O \longrightarrow 2\ CaOH + H_2 + Heat$

(b) $CaO + H_2O \longrightarrow Ca(OH)_2 + H_2 + Heat$

(c) $CaO + H_2O \longrightarrow Ca(OH)_2 + Heat$

(d) $2\ CaO + 3\ H_2O \longrightarrow 2\ Ca(OH)_3 + O_2 + Heat$

2022-PYQ

1.A student while burning a magnesium ribbon in air, collected the products in a wet watch glass. The new product obtained was

: (a) Magnesium oxide

(b) Magnesium carbonate

(c) Magnesium hydroxide
(d) Magnesium chloride

2.Consider the following chemical equation :

2NaOH + H2SO4 ⟶ ⟶ N a 2 S O 4 + 2 H 2 O $Na_2SO_4 + 2H_2O$ T

he informations conveyed by this equation are :

I. NaOH reacts with H2SO4 to produce N a 2 S O 4 Na_2SO_4 and water.

II. For every one molecule of H2SO4, two molecules of NaOH are required.

III. Acids and bases are non-ionic in nature.

IV. This is not a redox reaction.

(a) I and II, IV (b) II and III (c) III and IV (d) I and IV

3.Select the correct matching in the following table in connection with the given chemical reaction

: CuSO4 + Fe ⟶ ⟶ FeSO4 + Cu

Initial colour of solution Final colour of solution Final colour of iron nail Type of reaction

a. Pale green Blue Grey Displacement

b. Blue Pale green Brownish Double displacement

c. Blue Light Blue Grey Double displacement

d. Blue Pale green Brownish Displacement

4.Consider the following processes :

I. Dilution of sulphuric acid

II. Sublimation of dry ice

III. Condensation of water vapours

IV. Dissolution of ammonium chloride in water

The endothermic process(es) is/are :

(a) I and III (b) II only (c) III only (d) II and IV

Following questions consist of two statements – Assertion (A) and Reason (R).

Answer these questions selecting the appropriate option given below:

(a) Both A and R are true and R is the correct explanation of A.

(b) Both A and R are true but R is not the correct explanation of A.

(c) A is true but R is false.

(d) A is false but R is true.

(e) Both A and R are false

Q.1. Assertion (A): Decomposition of vegetable matter into compost is an example of exothermic
reactions.
Reason (R): Exothermic reaction are those reactions in which heat is evolved.
Q.2. Assertion (A): Calcium carbonate when heated gives calcium oxide and water.
Reason (R): On heating calcium carbonate, decomposition reaction takes place.

Q.3. Assertion (A): Brown fumes are produced when lead nitrate is heated.
Reason (R): Nitrogen dioxide gas is produced as a by-product due to the decomposition of lead nitrate.
Q.4. Assertion (A): White silver chloride turns grey in sunlight.
Reason (R): Decomposition of silver chloride in presence of sunlight takes place to form silver metal and chlorine gas.
Q.5.Assertion (A): AgBr is used on photographic and X-ray film.
Reason (R): AgBr is photosensitive and changes to Ag and bromine in presence
ASSERTION- REASON
1-(a), 2-(d), 3-(a),4-(a), 5-(a)