ACHIEVERS FOUNDATION

CBSE 10th : CHEMISTRY

Chemical Equations &Reactions PYQs

Previous Year Questions 2024

Q1: Select from the following a decomposition reaction in which the source of energy for decomposition is light: (2024)

(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) $CaCO_3 \rightarrow CaO + CO_2$

Q2: When 2 mL of sodium hydroxide solution is added to a 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: (2024)

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

Q3: Select from the following a process in which a combination reaction is involved: (2024)

(a) Black and White photography

(b) Burning of coal

(c) Burning of methane

(d) Digestion of food

Q4: Consider the following cases:

(A) $CaSO_4 + Al \rightarrow$

(B) $CuSO_4 + Ca \rightarrow$

(C) $FeSO_4 + Cu \rightarrow$

(D) $ZnSO_4 + Mg \rightarrow$

The cases in which new products will form are: (2024)

(a) (A) and (B)

(b) (B) and (C)

(c) (C)and(D)

(d) (B) and (D)

Q5: Identify the correct statement about the following reaction: (2024)

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

(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.

Q6: Consider the following Chemical equation: (2024)

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

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

Q7: Which of the following reactions is different from the remaining three? (2024)
(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) $ZnCl_2 + H_2S \rightarrow ZnS + 2HCl$

Q8: $Zn + 2CH_3COOH \rightarrow Zn(CH_3COO)_2 + H_2$ (2024)
The above reaction is a:
(a) Decomposition reaction
(b) Displacement reaction
(c) Double displacement reaction
(d) Combination reaction

Q9: To balance the following chemical equation, the values of the coefficients x, y and z must be respectively : (2024)

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

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

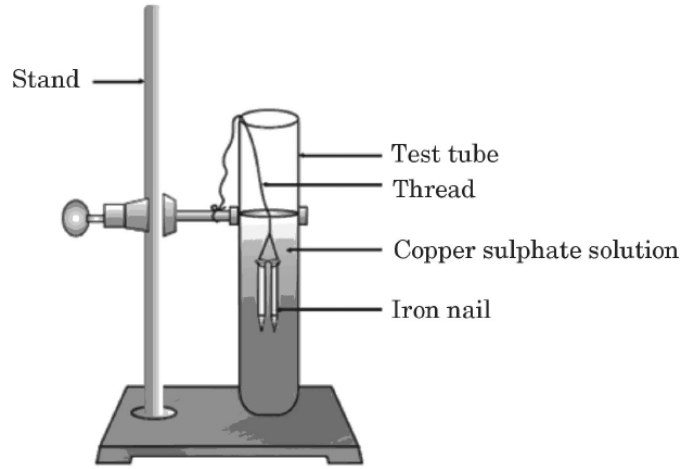
Q10: Which of the following is a redox reaction, but not a combination reaction? (2024)
(a) $C + O_2 \rightarrow CO_2$
(b) $2\ H_2 + O_2 \rightarrow 2\ H_2O$
(c) $2\ Mg + O_2 \rightarrow 2\ MgO$
(d) $Fe_2O_3 + 3\ CO \rightarrow 2\ Fe + 3\ CO_2$

Q11: Name the type of chemical reaction in which calcium oxide reacts with water. Justify your answer by giving a balanced chemical equation for the chemical reaction. (2024)

Q12: Write one chemical equation each for the chemical reaction in which the following have taken place:
(i) Change in colour
(ii) Change in temperature
(iii) Formation of precipitate
Mention colour change/temperature change (rise/fall)/compound precipitated along with the equation. (2024)

Q13: When magnesium ribbon is burnt in the air, an ash of white colour is produced. Write the chemical equation for the reaction giving the chemical name of the ash produced. State the type of chemical reaction justifying your answer. (2024)

Q14:Study the experimental set-up shown in the diagram and write a chemical equation for the chemical reaction involved. Name and define the type of reaction. List two other metals that can be used in place of iron to show the same type of reaction with copper sulphate solution. (2024)



Q15: For Q. Nos., two statements are given - One labelled as Assertion (A) and the other labelled as Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below: (2024)
Assertion (A): Hydrogen gas is not evolved when zinc reacts with nitric acid.
Reason (R): Nitric acid oxidises the hydrogen gas produced to water and itself gets reduced.
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
(b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
(c) Assertion (A) is true, but Reason (R) is false.
(d) Assertion (A) is false, but Reason (R) is true.

Q16: What is a chemical reaction? Describe one activity each to show that a chemical change has occurred in which (i) a change of colour, and (ii) a change in temperature has taken place. (2024)

Q17: (i) Define a decomposition reaction. How can we say that (I) electrolysis of water, and (II) blackening of silver bromide when exposed to sunlight, are decomposition reactions? Mention the type of energy involved in each case.
(ii) The type of reactions in which (I) calcium oxide is formed, and (II) calcium hydroxide is formed are opposite reactions to each other. Justify this statement with the help of chemical equations. (2024)

Q18: (a) Copper powder is taken in a china dish and heated over a burner. Name the product formed and state its colour. Write the chemical equation for the reaction involved. (2024)
OR
(b) Write a chemical equation for the chemical reaction that occurs when the aqueous solutions of barium chloride and sodium sulphate react together. Write the symbols of the ions present in the compound precipitated in the reaction.

Q19: (A) Write the essential conditions for the following reaction to take place and name its types:
$2AgCl \rightarrow 2Ag + Cl_2$
(B) Complete the following chemical reaction in the form of a balanced equation:

$$FeSO_4 \xrightarrow{\Delta} Fe_2O_3 + \ldots\ldots + \ldots\ldots$$

(CBSE 2024)

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Previous Year Questions 2023

Q1: When aqueous solutions of potassium iodide and lead nitrate are mixed, an insoluble substance separates out. The chemical equation for the reaction involved is (2023)

(a) $KI + PbNO_3 \rightarrow PbI + KNO_3$

(b) $2KI + Pb(NO_3)_2 \rightarrow PbI_2 + 2KNO_3$

(c) $KI + Pb(NO_3)_2 \rightarrow PbI + KNO_3$

(d) $KI + PbNO_3 \rightarrow PbI_2 + KNO_3$

Q2: The balanced chemical equation showing the reaction between quick lime and water is (2023)

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

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

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

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

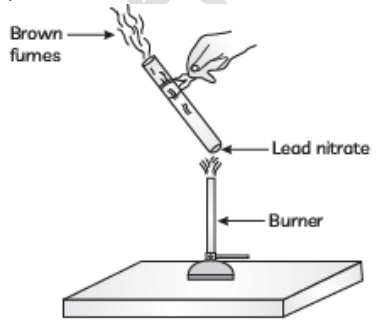
Q3: Assertion (A): In the following reaction $ZnO + C \rightarrow Zn + CO$
ZnO undergoes reduction.
Reason (R): Carbon is a reducing agent that reduces ZnO to Zn. (2023)
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A)
(b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A)
(c) Assertion (A) is true, but Reason (R) is False.
(d) Assertion (A) is false, but Reason (R) is true.

Q4: Assertion (A): The reaction of quick lime with water is an exothermic reaction.
Reason (R): Quicklime reacts vigorously with water releasing a large amount of heat. (2023)
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A)
(b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A)
(c) Assertion (A) is true, but Reason (R) is False
(d) Assertion (A) is false, but Reason (R) is true

Q5: (i) While electrolyzing water before passing the current some drops of an acid are added why? Name the gases liberated at the cathode and anode. Write the relationship between the volume of gas collected at the anode and the volume of gas collected at the cathode.
(ii) What is observed when silver chloride is exposed to sunlight? Give the type of reaction involved. (2023 C)

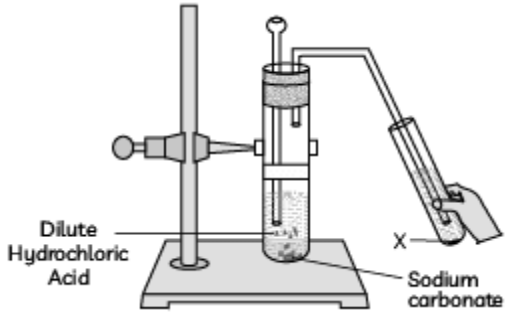
Q6: (a) Define a double displacement reaction.
(b) Write the chemical equation of a double displacement reaction which is also a (i) Neutralisation reaction and (ii) Precipitation reaction. Give justification for your answer. (2023)

Q7: The emission of brown fumes in the given experimental set-up is due to:



(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. (CBSE 2023)

Q8: In the experimental setup given below, it is observed that on passing the gas produced in the reaction in the solution 'X' the solution 'X' first turns milky and then colourless.



The option that justifies the given observation is that 'X' is aqueous calcium hydroxide and:
(a) it turns milky due to carbon dioxide gas liberated in the reaction and after some time it becomes colourless due to the formation of calcium carbonate.
(b) it turns milky due to the formation of calcium carbonate and on passing excess of carbon dioxide it becomes colourless due to the formation of calcium hydrogen carbonate which is soluble in water.
(c) it turns milky due to the passing of carbon dioxide through it. It turns colourless as on further passing carbon dioxide, sodium hydrogen carbonate is formed which is soluble in water.
(d) the carbon dioxide liberated during the reaction turns lime water milky due to the formation of calcium hydrogen carbonate and after some time, it turns colourless due to the formation of calcium carbonate which is soluble in water. (CBSE 2023)

Q9: Assertion (A): The colour of aqueous solution of copper sulphate turns colourless when a piece of lead is added to it.
Reason (R): Lead is more reactive than copper, and hence displaces copper from its salt solution.
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A)
(b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A)
(c) Assertion (A) is true, but Reason (R) is False
(d) Assertion (A) is false, but Reason (R) is true (CBSE 2023)

Q10: (A) Identify the reducing agent in the following reactions:
(i) $4NH_3 + 5O_2 \rightarrow 4NO + 6H_2O$
(ii) $H_2O + F_2 \rightarrow HF + HOF$
(iii) $Fe_2O_3 + 3CO \rightarrow 2Fe + 3CO_2$
(iv) $2H_2 + O_2 \rightarrow 2H_2O$
(B) Define a redox reaction in terms of gain or loss of oxygen.

Previous Year Questions 2022

Q1: Sodium reacts with water to form sodium hydroxide and hydrogen gas. The balanced equation which represents the above reaction is (2022)
(a) $Na_{(s)} + 2H_2O(l) \rightarrow 2NaOH_{(aq)} + 2H_{2(g)}$
(b) $2Na_{(s)} + 2H_2O_{(l)} \rightarrow 2NaOH_{(aq)} + H_{2(g)}$

(c) $2Na_{(s)} + 2H_2O_{(l)} \rightarrow NaOH_{(aq)} + 2H_{2(g)}$

(d) $2Na_{(s)} + H_2O_{(l)} \rightarrow 2NaOH_{(aq)} + 2H_{2(g)}$

Q2: It is important to balance the chemical equations to satisfy the law of conservation of mass. Which of the following statements of the law is incorrect? (2022)

(a) The total mass of the elements present in the reactants is equal to the total mass of the elements present in the products.

(b) The number of atoms of each element remains the same, before and after a chemical reaction.

(c) The chemical composition of the reactants is the same before and after the reaction.

(d) Mass can neither be created nor can it be destroyed in a chemical reaction.

Q3: $C_6H_{12}O_6(aq) + 6O_2(g) \rightarrow 6CO_2(g) + 6H_2O(l)$

The above reaction is a/an (2022)

(a) Displacement reaction

(b) Endothermic reaction

(c) Exothermic reaction

(d) Neutralisation reaction

Q4: Which of the following statements about the reaction given below are correct?

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

(i) HCL is oxidized to Cl_2.

(ii) MnO_2 is reduced to $MnCl_2$.

(iii) $MnCl_2$ acts as an oxidizing agent.

(iv) HCl acts as an oxidizing agent. **(2022)**

(a) (ii), (iii) and (iv)

(b) (i), (ii) and (iii)

(c) (i) and (ii) only

(d) (iii) and (iv) only

Q5: Assertion (A): Burning of natural gas is an endothermic process.

Reason (R): Methane gas combines with oxygen to produce carbon dioxide and water. (2022)

(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.

Q6: 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 (2022)

(a) I and III

(b) II only

(c) III only

(d) II and IV

Q7: When lead nitrate powder is heated in a boiling tube. we observe (2022)

(a) Brown fumes of nitrogen dioxide

(b) Brown fumes of lead oxide

(c) Yellow fumes of nitrogen dioxide

(d) Brown fumes of nitric oxide.

Q8: Assertion (A): Silver salts are used in black-and-white photography.
Reason (R): Silver salts do not decompose in the presence of light. (2022)
(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.

Q9: Mention with reason the colour changes observed when: (2022)
(A) Silver chloride is exposed to sunlight
(B) Copper powder is strongly heated in the presence of oxygen
(C) A piece of zinc is dropped in copper sulphate solution.

Q10: A shining metal 'M', on burning gives a dazzling white flame and changes to a white powder 'N'.

(a) Identify 'M' and 'N'.

(b) Represent the above reaction in the form of a balanced chemical equation.

(c) Does 'M' undergo oxidation or reduction in this reaction? Justify. (2022)