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Chemical Reactions And Equations T2

10th Standard

Science

25 x 1 = 25

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

2) Which of the following statements about the given reaction are correct?
$3Fe(s) + 4H_2O(g) \rightarrow Fe_3O_4(s) + 4H_2(g)$
(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) (iii) and (iv) (c) (i), (ii) and (iv) (d) (ii) and (iv)

3) A dilute ferrous sulphate solution was gradually added to the beaker containing acidified permanganate solution. The light purple colour of the solution fades and finally disappears. Which of the following is the correct explanation for the observation?

(a) $KMnO_4$ is an oxidising agent, it oxidises $FeSO_4$ (b) $FeSO_4$ acts as an oxidising agent and oxidises $KMnO_4$

(c) The colour disappears due to dilution; no reaction is involved

(d) $KMnO_4$ is an unstable compound and decomposes in presence of $FeSO_4$ to a colourless compound.

4) Which among the following is /are double displacement reaction(s) ?
(i) $Pb + CuCl_2 \rightarrow PbCl_2 + Cu$
(ii) $Na_2SO_4 + BaCl_2 \rightarrow BaSO_4 + 2NaCl$
(iii) $C + O_2 \rightarrow CO_2$
(iv) $CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$

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

5) 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

6) In the double displacement reaction between aqueous potassium iodide and aqueous lead nitrate, a yellow precipitate of lead iodide is formed. While performing the activity if lead nitrate is not available, which of the following can be used in place of lead nitrate?

(a) Lead sulphate (insoluble) (b) Ammonium nitrate (c) Lead acetate (d) Potassium sulphate

7) In which of the following chemical equations, the abbreviations represent the correct states of the reactants and products involved temperature?

(a) $2H_2(l) + O_2(l) \rightarrow 2H_2O(g)$ (b) $2H_2(g) + O_2(l) \rightarrow 2H_2O(l)$ (c) $2H_2(g) + O_2(g) \rightarrow 2H_2O(l)$ (d) $2H_2(g) + O_2(g) \rightarrow 2H_2O(g)$

8) Which of the following are combination reactions?
(i) $2KClO_3 \xrightarrow{\Delta} 2KCl + 3O_2$
(ii) $MgO + H_2O \rightarrow Mg(OH)_2$
(iii) $4Al + 3O_2 \rightarrow 2Al_2O_3$
(iv) $Zn + FeSO_4 \rightarrow ZnSO_4 + Fe$

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

9) Which of the following will be required to identify the gas evolved when dilute hydrochloric acid reacts with zinc metal?

(a) Red litmus paper (b) A burning splinter (c) Lime water (d) PH paper

10) When a magnesium ribbon is burnt in air, the ash formed is

(a) pink (b) white (c) black (d) yellow

11) The electrolytic decomposition of water gives H_2 and O_2 in the ratio of

(a) 1 : 2 by volume (b) 2 : 1 by volume (c) 8 : 1 by mass (d) 1 : 2 by mass

12) In the decomposition of lead (II) nitrate to give lead (II) oxide, nitrogen dioxide and oxygen gas, the coefficient of nitrogen dioxide (in the balanced equation) is

(a) 1 (b) 2 (c) 3 (d) 4

13) The reaction in which two compound exchange their ions to form two new compounds is called

(a) displacement reaction (b) combination reaction (c) double displacement reaction (d) redox reaction

14) On immersing an iron nail in $CuSO_4$ solution for few minutes, you will observe

(a) no reaction takes place (b) the colour of solution fades away (c) the surface of iron nails acquire a black coating

(d) the colour of solution changes to green

15) Physical changes are accompanied by:

(a) Evolution of hydrogen gas (b) Change in state (c) Formation of a new yellow precipitate (d) Formation of a new compound

16) If reaction between nitrogen and hydrogen to form ammonia is exothermic, then it will be accompanied by

(a)

17) Change in state (b) Change in colour (c) Evolution of heat (d) Formation of precipitate

18) During an exothermic reaction

(a) Heat is absorbed (b) There is no heat transfer (c) Heat can either be absorbed or evolved (d) Heat is evolved.

19) The reactions in which precipitate is formed are known as

(a) Exothermic reactions (b) Endothermic reactions (c) Precipitation reactions (d) Combustion reactions

20) An example of reaction in which gas is evolved is

(a) Reaction between limestone and HCl (b) Burning of magnesium ribbon in air (c) Reaction between Calcium oxide and water

(d) Reaction between lead nitrate and potassium iodide

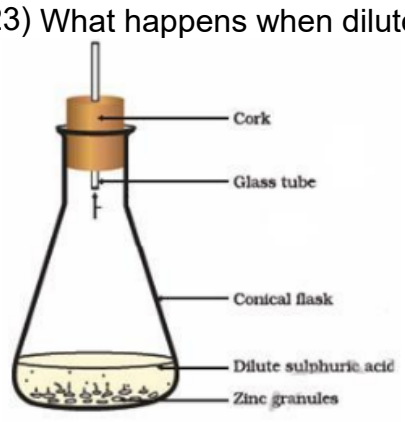
21) Freezing of water is a

(a) Physical change (b) Chemical change (c) Both physical and chemical change (d) Exothermic reaction

22) Which of the following feature is common to both physical and chemical change?

(a) Evolution of hydrogen gas (b) Formation of new precipitate (c) Evolution of carbon dioxide (d) Change in state and colour

23) What happens when dilute sulphuric acid is added to zinc granules? Select the correct option



(a) Water and zinc sulphate is formed (b) No reaction takes place (c) Hydrogen and zinc sulphate is formed

(d) Hydrogen gas and zinc sulphide is formed.

24) Setting of cement is an example of

(a) Physical change (b) Precipitation reaction (c) Endothermic reaction (d) Exothermic reaction

25) Select the chemical equation which is unbalanced

(a) $NaOH + CO_2 \rightarrow Na_2CO_3 + H_2O$ (b) $CuSO_4 + H_2S \rightarrow H_4SO_2 + CuS$ (c) $2FeCl_3 + H_2S \rightarrow 2FeCl_2 + 2HCl + S$

(d) $2Mg + CO_2 \rightarrow 2MgO + C$

26) The balanced chemical equation for the reaction of zinc metal with hydrochloric acid is

(a) $Zn + HCl \rightarrow ZnCl + H_2$ (b) $Zn + HCl \rightarrow ZnCl_2 + H_2$ (c) $Zn + 2HCl \rightarrow 2ZnCl_2 + H_2$ (d) $Zn + 2HCl \rightarrow ZnCl_2 + H_2$

5 x 1 = 5

27) **Assertion:** Reaction of calcium oxide and water is exothermic.

Reason: Calcium oxide and water combine to form a single product, calcium hydroxide.

Codes

(a) If both assertion and reason are true and the reason is correct explanation of assertion.
(b) If both assertion and reason are true but reason is not a correct explanation of assertion.
(c) If assertion is true and reason is false.
(d) If both assertion and reason are false.

28) **Assertion:** Chemical reaction in test tube concluded with the fall in the temperature of the reaction.

Reason: The reaction has absorbed heat from surroundings and is called exothermic reaction.

Codes

(a) If both assertion and reason are true and the reason is correct explanation of assertion.
(b) If both assertion and reason are true but reason is not a correct explanation of assertion.
(c) If assertion is true and reason is false.
(d) If both assertion and reason are false.

29) **Assertion:** In the reaction, $Zn_{(s)} + 2H^+_{(aq)} \rightarrow Zn^{2+}_{(aq)} + H_{2(g)}$ ' zinc acts as an oxidising agent and H^+ acts as a reducing agent.

Reason: An oxidising agent accepts electrons while a reducing agent loses electrons.

Codes

(a) Both A and R are true, and R is correct explanation of the assertion.
(b) Both A and R are true, but R is not the correct explanation of the assertion.
(c) A is true, but R is false.
(d) A is false, but R is true.

30) **Assertion:** Corrosion of iron is commonly known as rusting.

Reason: Corrosion of iron occurs in presence of moist air.

Codes

(a) Both A and R are true, and R is correct explanation of the assertion.
(b) Both A and R are true, but R is not the correct explanation of the assertion.
(c) A is true, but R is false.
(d) A is false, but R is true.

31) **Assertion:** Following reaction describes the rusting of iron and is a redox reaction

$4Fe + 3O_2 \rightarrow 4Fe^{3+} + 6O^{2-}$

Reason: The metallic iron is oxidised to Fe^{3+}.

Codes

(a) Both A and R are true, and R is correct explanation of the assertion.
(b) Both A and R are true, but R is not the correct explanation of the assertion.
(c) A is true, but R is false.
(d) A is false, but R is true.

4 x 5 = 20

32) (a) Define a balanced chemical equation. Why should an equation be balanced?
(b) Write the balanced chemical equation for the following reaction:
(i) Phosphorus burns in presence of chlorine to form phosphorus pentachloride.
(ii) Burning of natural gas.
(iii) The process of respiration.

33) (i) What is observed when a solution of potassium iodide is added to a solution of lead nitrate taken in a test tube?
(ii) What type of reaction is this?
(iii) Write a balanced chemical equation to represent the above reaction.

34) Chemical equation is a method of representing a chemical reaction with the help of symbols and formulae of the substances involved in it. In a chemical equation, the substances which combine or react are called reactants and new substances produced are called products. A chemical equation is a short hand method of representing a chemical reaction. A balanced chemical equation has equal number of atoms of different elements in the reactants and products side. An unbalanced chemical equation has unequal number of atoms of one or more elements in reactants and products. Formulae of elements and compounds are not changed to balance an equation.

(i) Consider the following reaction:

$pMg_3N_2 + qH_2O \rightarrow rMg(OH)_2 + sNH_3$

When the equation is balanced, the coefficients p, q, r, s respectively are

(a) 1,3,3,2 **(b) 1,6,3,2**
(c) 1,2,3,2 **(d) 2,3,6, 2**

(ii) Which of the following information is not conveyed by a balanced chemical equation?

(a) Physical states of reactants and products
(b) Symbols and formulae of all the substances involved in a particular reaction
(c) Number of atoms/molecules of the reactants and products formed
(d) Whether a particular reaction is actually feasible or not

(iii) The balancing of chemical equations is in accordance with

(a) law of combining volumes
(b) law of constant proportions
(c) law of conservation of mass
(d) both (b) and (c)

(iv) Which of the following chemical equations is an unbalanced one?

$(a) 2NaHCO_3 \longrightarrow Na_2CO_3 + H_2O + CO_2$
$(b) 2C_4H_{10} + 12O_2 \longrightarrow 8CO_2 + 10H_2O$
$(c)\ 2Al + 6H_2O \longrightarrow 2Al(OH)_3 + 3H_2$
$(d)\ 4NH_3 + 5O_2 \longrightarrow 4NO + 6H_2O$

(v) Which of the following statements is/are correct?

(a) A chemical equation tells us about the substances involved in a reaction.
(b) A chemical equation informs us about the symbols and formulae of the substances involved in a reaction.
(c) A chemical equation tells us about the atoms or molecules of the reactants and products
(d) All the above

35) In a balanced chemical reaction, equal number of atoms are present on both sides of reaction. A balanced chemical reaction is based on law of conservation of mass which means that total mass of reactants and products participating in a reaction must be equal. For example, a balanced chemical equation of burning of magnesium in oxygen to form magnesium oxide is written as :

$2\mathrm{Mg} + \mathrm{O}_2 \longrightarrow 2\mathrm{MgO}$

The mass of reactants (2 x 24 + 32 = 80) is equal to the mass of products [2 x (24 + 16) = 80]

(i) In a reaction, 35 g of reactant, PQ breaks down into 20 g of product, P and an unknown amount of product, Q. Using the law of conservation of mass, weight of products, Q will be

(**a) 25g** **(b) 35g** **(c) 30g** **(d) 15g**