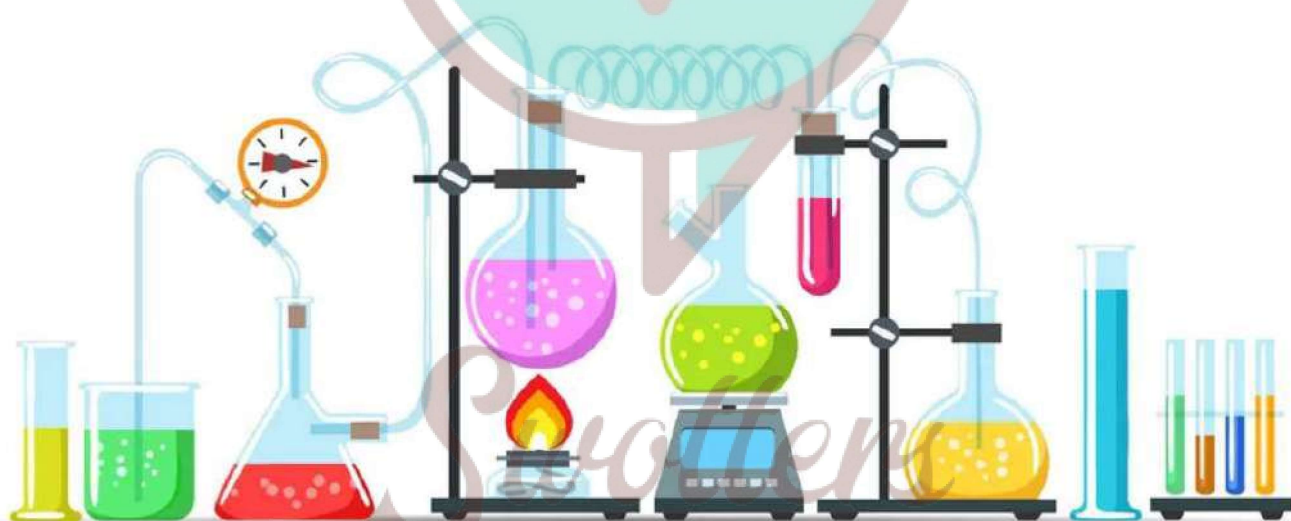


SCIENCE

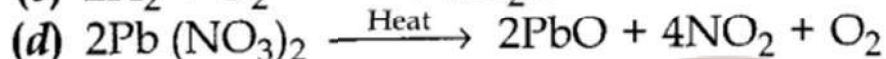
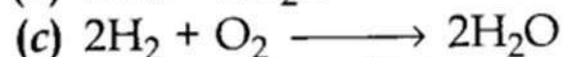
(Chemistry)



Important Questions

➤ Multiple Choice Questions:

1. Which of the following is a displacement reaction?



2. Magnesium ribbon is rubbed before burning because it has a coating of

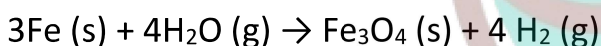
(a) basic magnesium carbonate

(b) basic magnesium oxide

(c) basic magnesium sulphide

(d) basic magnesium chloride

3. Which of the following statements about the given reaction are correct?



(i) Iron metal is getting oxidized

(ii) Water is getting reduced

(iii) Water is acting as reducing agent

(iv) Water is acting as oxidizing agent

(a) (i), (ii) and (iii)

(b) (ii) and (iv)

(c) (i), (ii) and (iv)

(d) (ii) and (iv)

4. 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)

5. Oxidation is a process which involves

(a) addition of oxygen

(b) addition of hydrogen

- (c) removal of oxygen
- (d) removal of hydrogen

6. The process of reduction involves

- (a) addition of oxygen
- (b) addition of hydrogen
- (c) removal of oxygen
- (d) removal of hydrogen

7. Three beakers labelled as A, B and C each containing 25 ml of water were taken. A small amount of NaOH, anhydrous CuSO_4 and NaCl were added to the beakers A, B and C respectively. It was observed that there was an increase in the temperature of the solution contained in beakers A and B, whereas in case of beaker C, the temperature of the solution falls. Which one of the following statement(s) is (are) correct?

- (i) In beakers A and B, exothermic process has occurred.
- (ii) In beakers A and B, endothermic process has occurred.
- (iii) In beaker C exothermic process has occurred.
- (iv) In beaker C endothermic process has occurred.

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

8. Give the ratio in which hydrogen and oxygen are present in water by volume.

- (a) 1:2
- (b) 1:1
- (c) 2:1
- (d) 1:8

9. Which among the following statement(s) is (are) true?

Exposure of silver chloride to sunlight for a long duration turns grey due to

- (i) the formation of silver by decomposition of silver chloride
- (ii) sublimation of silver chloride
- (iii) decomposition of chlorine gas from silver chloride
- (iv) oxidation of silver chloride

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

10. $\text{MnO}_2 + 4\text{HCl} \rightarrow 2 + 2\text{H}_2\text{O} + \text{Cl}_2$

Identify the substance oxidized in the above equation.

- (a) MnCl_2
- (b) HCl
- (c) H_2O
- (d) MnO_2

➤ **Very Short Question:**

1. How does the food become rancid?
2. A student burnt a metal A found in the form of ribbon. The ribbon burnt with a dazzling flame and a white powder B was formed which was basic in nature. Identify A and B. Write the balanced chemical equation.
3. What is a balanced chemical equation?
 1. 4. Write a balanced equation for a chemical reaction that can be characterized as precipitation.
4. What is rust?
5. A zinc rod is left for nearly 20 minutes in a copper sulphate solution. What change would you observe in the zinc rod?
6. Name two salts that are used in black and white photography.
7. Which chemical process is used for obtaining a metal from its oxide?
8. If you collect silver coins and copper coins you may have seen that after some days a black coating forms on silver coins and a green coating on copper coins. Which chemical phenomenon is responsible for these coatings? Write the chemical name of the black and green coatings.
9. When carbon dioxide is passed through lime water, it turns milky, why?

➤ **Short Questions:**

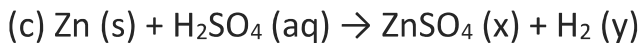
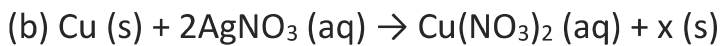
1. You are given the following materials

(i) Marble chips (ii) dilute hydrochloric acid (iii) Zinc granules

Identify the type of reaction when marble chips and zinc granules are added separately to acid taken in two test tubes.

2. What do you understand by precipitation reaction? Explain with suitable examples.
3. What happens when aqueous solutions of sodium sulphate and barium chloride are mixed? What type of reaction is it?
4. Explain the following terms with suitable examples.
 - (a) Oxidation
 - (b) Reduction

5. Complete the missing components/variables given as x and y in the following reactions.



6. An iron knife kept dipped in a blue copper sulphate solution turns the blue solution light green. Why?

7. A, B and C are three elements which undergo chemical reactions in the following way.



Answer the following:

(a) Which element is most reactive?

(b) Which element is least reactive?

8. Write the balanced chemical equations for the following reactions and identify the type of reaction in each case.

(a) Nitrogen gas is treated with hydrogen gas in the presence of a catalyst at 773 K to form ammonia gas.

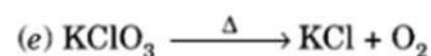
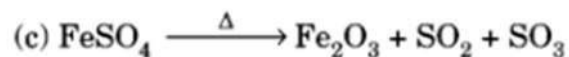
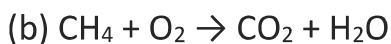
(b) Sodium hydroxide solution is treated with acetic acid to form sodium acetate and water.

(c) Ethanol is warmed with ethanoic acid to form ethyl acetate in the presence of concentrated H_2SO_4 .

(d) Ethene is burnt in the presence of oxygen to form carbon dioxide, water and releases heat and light.

➤ Long Questions:

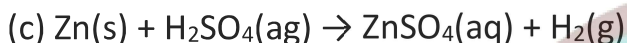
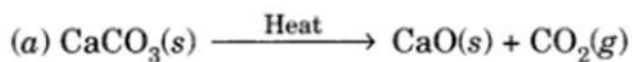
1. Balance the following equations:



2. On heating blue coloured powder of copper (II) nitrate in a boiling tube, copper oxide (black), oxygen gas and a brown gas X is formed.

- (a) Write a balanced chemical equation of the reaction.
 (b) Identify the brown gas X evolved.
 (c) Identify the type of reaction.
 (d) What could be the pH range of aqueous solution of the gas X?

3. (A) Name the type of chemical reaction represented by the following equation:



(B) "A solution of potassium chloride when mixed with silver nitrate solution, and an insoluble white substance is formed".

- (i) Translate the above statement into a chemical equation.
 (ii) State two types for the classification of this reaction.

➤ Assertion Reason Questions:

1. For two statements are given-one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below:
- Both A and R are true, and R is correct explanation of the assertion.
 - Both A and R are true, but R is not the correct explanation of the assertion.
 - A is true, but R is false.
 - A is false, but R is true.

Assertion: Silver articles become black after sometime when exposed to sunlight.

Reason: It is because silver reacts with carbonates present in the air.

2. For two statements are given-one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below:
- Both A and R are true, and R is correct explanation of the assertion.
 - Both A and R are true, but R is not the correct explanation of the assertion.
 - A is true, but R is false.
 - A is false, but R is true.

Assertion: A lead nitrate on thermal decomposition gives lead oxide, brown coloured nitrogen dioxide and oxygen gas.

Reason: Lead nitrate reacts with potassium iodide to form yellow ppt. of lead iodide and the reaction is double displacement as well as precipitation reaction.

➤ Case Study Questions:

1. Read the following and answer any four questions from (i) to (v).

Oxidation has damaging effect on metals as well as on food. The damaging effect of oxidation on metal is studied as corrosion and that on food is studied as rancidity. The phenomenon due to which metals are slowly eaten away by the reaction of air, water and chemicals present in atmosphere, is called corrosion. For example, iron articles are shiny when new, but get coated with a reddish-brown powder when left for some time. This process is known as rusting of iron. Rancidity is the process of slow oxidation of oil and fat (which are volatile in nature) present in the food materials resulting in the change of smell and taste in them.

- i. Rancidity can be prevented by:
 - a. Adding antioxidants.
 - b. Packaging oily food in nitrogen gas.
 - c. Both (a) and (b).
 - d. None of these.
- ii. Combination of phosphorus and oxygen is an example of:
 - a. Oxidation.
 - b. Reduction.
 - c. Rancidity.
 - d. None of these.
- iii. A science teacher wrote the following statements about rancidity:
 - I. When fats and oils are reduced, they become rancid.
 - II. In chips packet, rancidity is prevented by oxygen.
 - III. Rancidity is prevented by adding antioxidants.

Select the correct option.

- a. (I) only
 - b. (II) and (III) only
 - c. (III) only
 - d. (I), (II) and (III)
- iv. Two statements are given below regarding rusting of iron.
 - I. The rusting of iron is a redox reaction and reaction occurs as, $4\text{Fe} + 3\text{O}_2 \rightarrow 4\text{Fe}^{3+} + 6\text{O}^{2-}$
 - II. The metallic iron is oxidised to Fe^{2+} and O_2 is reduced to O^{2-} .

Select the correct statement(s).

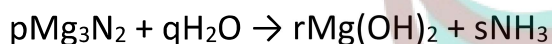
- a. I only.
 - b. II only.
 - c. Both I and II.
 - d. None of these.
- v. Which of the following measures can be adopted to prevent or slow down rancidity?
 - I. Food materials should be packed in airtight container.

- II. Food should be refrigerated.
- III. Food materials and cooked food should be kept away from direct sunlight.
 - a. Only II and III.
 - b. Only I and III.
 - c. Only II and III.
 - d. I, II and III.

2. Read the following and answer any four questions from (i) to (v).

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 shorthand 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:



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. $2\text{NaHCO}_3 \rightarrow \text{Na}_2\text{CO}_3 + \text{H}_2\text{O} + \text{CO}_2$
 - b. $2\text{C}_4\text{H}_{10} + 12\text{O}_2 \rightarrow 8\text{CO}_2 + 10\text{H}_2\text{O}$
 - c. $2\text{Al} + 6\text{H}_2\text{O} \rightarrow 2\text{Al}(\text{OH})_3 + 3\text{H}_2$
 - d. $4\text{NH}_3 + 5\text{O}_2 \rightarrow 4\text{NO} + 6\text{H}_2\text{O}$

- v. Which of the following statements is/ are correct?
- A chemical equation tells us about the substances involved in a reaction.
 - A chemical equation informs us about the symbols and formulae of the substances involved in a reaction.
 - A chemical equation tells us about the atoms or molecules of the reactants and products involved in a reaction.
 - All the above.

✓ Answer Key-

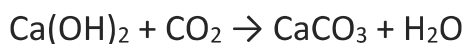
➤ Multiple Choice Answers:

- (b)
- (a) basic magnesium carbonate
- (c) (i), (ii) and (iv)
- (a) (i) and (ii)
- (a) addition of oxygen
- (b) addition of hydrogen
- (c) (i) and (iv)
- (a) 1 : 2
- (a) (i) only
- (d) MnO_2

➤ Very Short Answers:

- Answer: Food becomes rancid when fat and oils present in the food are oxidized.
- Answer: $X = \text{Mg}$, $Y = \text{MgO}$, $\text{Mg} + \text{O}_2 \rightarrow 2\text{MgO}$
- Answer: An equation that has equal number of atoms of each element on both the sides of the equation is called a balanced chemical equation, i.e., mass of the reactants is equal to mass of the products.
- Answer: $\text{BaCl}_2(\text{aq}) + \text{Na}_2\text{SO}_4(\text{aq}) \rightarrow \text{BaSO}_4(\text{s}) + 2\text{NaCl}(\text{aq})$
- Answer: It is a brown mass known as hydrated ferric oxide. Its formula is $\text{Fe}_2\text{O}_3 \cdot x\text{H}_2\text{O}$.
- Answer: The zinc rod will change into zinc sulphate.
- Answer: Both silver chloride and silver bromide are used in black and white photography.
- Answer: The process is known as the reduction of metal oxide.
- Answer: Corrosion is responsible for the formation of this coating. Black coating is due to formation of Ag_2S and green coating is due to formation of $\text{CuCO}_3 \cdot \text{Cu}(\text{OH})_2$.

10. Answer: Lime water (calcium hydroxide) combines with carbon dioxide to form a suspension of calcium carbonate which makes lime water milky.



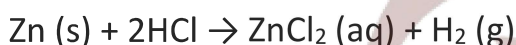
➤ Short Answer:

1. Answer:

(i) Marble chips react with dilute hydrochloric acid to form calcium chloride and carbon dioxide. It is a double displacement reaction.



(ii) Zinc granules react with dilute hydrochloric acid to give hydrogen gas. It is a displacement reaction.

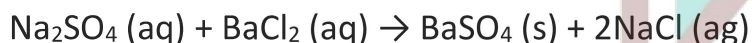


2. Answer:

The reaction in which two compounds in their aqueous state react to form an insoluble compound. When two reactants react and product formed remains insoluble and settles as a solid it is substance (precipitate) is called a precipitation reaction.

For example,

(i) When aqueous solution of sodium sulphate is mixed with an aqueous solution of barium chloride, barium sulphate is obtained as a white precipitate.



(ii) When aqueous solution of sodium chloride is mixed with an aqueous solution of silver nitrate, silver chloride is obtained as a white precipitate.

3. Answer:

On mixing the solutions of sodium sulphate and barium chloride, a white precipitate of barium sulphate is obtained.



It is a double displacement reaction.

4. Answer:

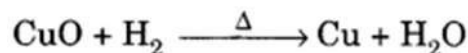
(a) Oxidation is a process of addition of oxygen to a substance or removal of hydrogen from a substance, for example,



Chemical Reactions and Equations Class 10 Extra Questions with Answers Science Chapter 1, 3

Copper is oxidized to CuO, as oxygen is added to copper.

(b) It is the process of removal of oxygen from a substance or addition of hydrogen to a substance, for example,



Copper oxide is reduced to copper as it involves removal of oxygen.

5. Answer:

(a) $x = (s)$, $y = (aq)$

(b) $x = 2\text{Ag}$

(c) $x = (aq)$; $y = (g)$

(d) $x = \text{heat}$

6. Answer:

We know that iron is more reactive than copper, so it displaces copper from copper sulphate solution and forms ferrous sulphate which is of light green colour.

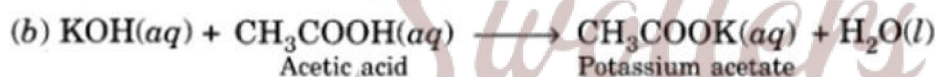
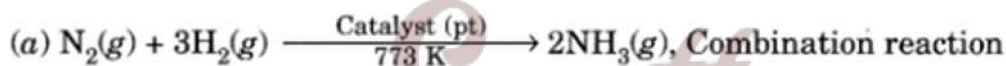


7. Answer:

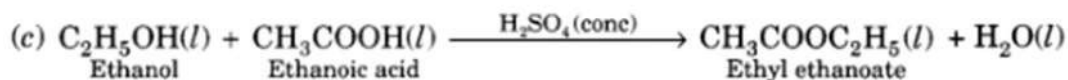
(a) The most reactive element is 'B'. It has displaced both 'A' and 'C' from their compounds.

(b) The least reactive element is 'C' as it has been displaced by both 'A' and 'B'.

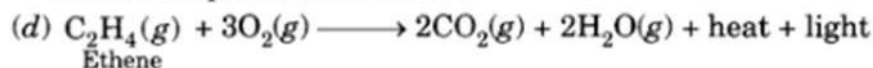
8. Answer:



Double displacement or neutralisation reaction



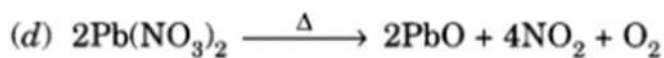
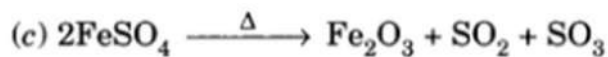
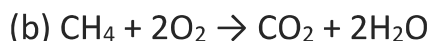
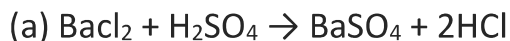
Double displacement reaction



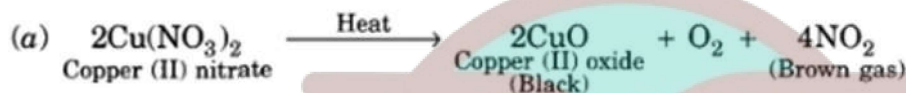
Combustion or redox reaction

➤ Long Answer:

1. Answer:



2. Answer:

(b) Brown gas X is nitrogen dioxide (NO_2).

(c) It is a thermal decomposition reaction.

(d) The gas (NO_2) is an oxide of a non-metal. Hence, its aqueous solution will be acidic, i.e., pH range would be between 0 and 7.

3. Answer:

(A) (a) Decomposition reaction

(b) Combination reaction

(c) Displacement reaction.

(B) (i) $\text{KCl}(\text{aq}) + \text{AgNO}_3(\text{aq}) \rightarrow \text{AgCl}(\text{s}) + \text{KNO}_3(\text{aq})$

(ii) It is a double displacement reaction also called precipitation reaction.

➤ **Assertion Reason Answer:**

1. Answer:

c. A is true, but R is false.

Silver reacts with sulphur present in the air and form the layer of silver sulphide therefore silver articles get tarnished.

2. Answer:

d. Both A and R are true, but R is not the correct explanation of the assertion.

Explanation:

Decomposition reaction is a reaction in which a compound breaks down into two or more simpler substances.

➤ **Case Study Answer:**

1. Answer:

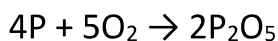
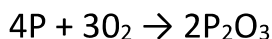
- i. (c) Both (a) and (b).

Explanation:

Antioxidants and nitrogen gas prevent oxidation of food.

- ii. Oxidation.

Explanation:



- iii. (c) (III) only

Explanation:

The oils and fats are slowly oxidised to certain bad smelling compounds, which release foul smell. This is known as rancidity. Rancidity is prevented by filling nitrogen gas in chips packets.

- iv. Only II and III.

- v. (d) I, II and III.

2. Answer:

- i. (b) 1, 6, 3, 2

Explanation:



- i. (d) Whether a particular reaction is actually feasible or not.

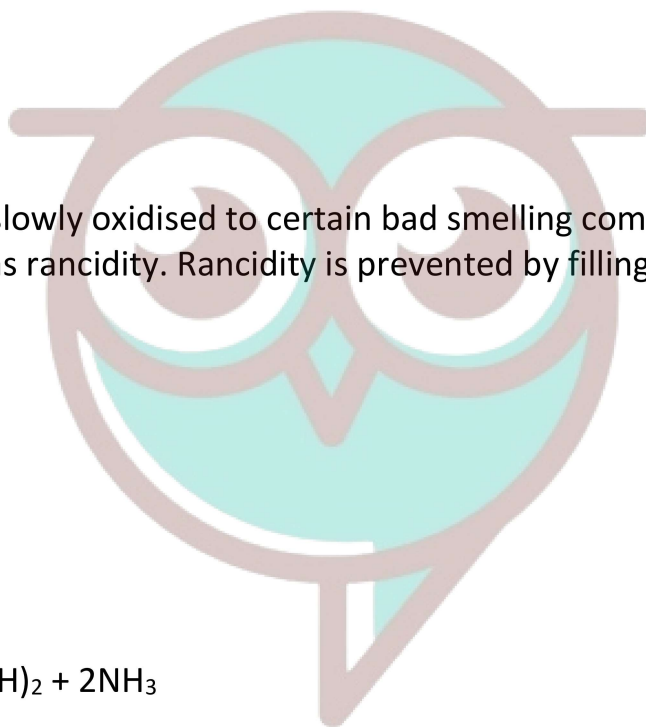
- ii. (c) law of conservation of mass.

Explanation:

In a balanced chemical equation, total mass of reactants must be equal to the total mass of products. This is the statement of law of conservation of mass.

- iv. (b) $2C_4H_{10} + 12O_2 \rightarrow 8CO_2 + 10H_2O$

- v. (d) All the above.



Swotters