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Jars Education

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Time : 1 Hour 30 Minute

STD 10 Science
Chapter Based Test

Total Marks : 50

SECTION A

*** Select and write one most appropriate option out of the four options given for each of the questions** **[7]**

1. Magnesium ribbon is burnt in an atmosphere of nitrogen gas to form solid magnesium nitride. This is a:

   (A) Decomposition reaction. (B) Combination reaction. (C) Displacement reaction. (D) Double displacement reaction.

2. Which of the following is an endothermic process?

   (A) Dilution of sulphuric acid. (B) Sublimation of dry ice. (C) Condensation of water vapours. (D) Respiration in human beings.

3. Two different atoms or groups of atoms are exchanged in:

   (A) Displacement reaction. (B) Double displacement reactions. (C) Substitution reaction. (D) Combination reaction.

4. What are the numbers that you CANNOT change in a chemical equation?

   (A) Coefficient (B) Products (C) Reactants (D) Subscripts

5. Consider the reaction,

   $$KBr(aq) + AgNO_3(aq) \longrightarrow KNO_3(aq) + AgBr(s)$$

   This is an example of:

   (A) Decomposition reaction. (B) Combination reaction. (C) Double displacement reaction. (D) Displacement reaction.

6. Write the balanced equation for the reaction for the following statement:

   Mg burns in presence of air.

   (A) $Mg(s) + O_2(g) \rightarrow MgO_2(s)$ (B) $2Mg(s) + 2O(g) \rightarrow 2MgO(s)$ (C) $2Mg(s) + O_2(g) \rightarrow 2MgO(s)$ (D) $Mg(s) + O_2(g) \rightarrow MgO(s)$

7. In which of the following chemical equations, the abbreviations represent the correct states of the reactants and products involved at reaction 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) $2H_2(g) + O_2(g) \rightarrow 2H_2O(g)$

*** Assertion - Reasoning based questions.** **[3]**

8. 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:

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.

Assertion: Food materials are often packed in air tight container.

Reason: Oxidation, resulting in rancidity, is prevented.

9. 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:

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.

Assertion: AgBr is used on photographic and X-ray film.

Reason: AgBr is photosensitive and changes to Ag and bromine in presence of sunlight and undergoes decomposition reaction.

10. 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:

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.

Assertion: The reaction during which hydrogen is lost is called oxidation reaction.

Reason: Reducing agent removes hydrogen from another substance.

*** Fill in the blank with correct answer.[1 Mark each]** **[2]**

11. Fill in the following blanks with suitable words:
The addition of oxygen to a substance is called _____ whereas removal of oxygen is called _____.

12. Complete and balance the following equations:
$\mathrm{Ca(OH)_2} + \ldots\ldots\ldots \longrightarrow \mathrm{CaCO_3} + \mathrm{H_2O}$

*** Answer the questions.[1 Mark each]** **[2]**

13. Convey the following information in the form of a balanced chemical equation:
"An aqueous solution of ferrous sulphate reacts with an aqueous solution of sodium hydroxide to form a precipitate of ferrous hydroxide and sodium sulphate remains in solution."

14. Write complete balanced equations for the following reactions:
Sulphur dioxide (gas) + Oxygen (gas) → Sulphur trioxide (gas)

SECTION B

*** Answer the following question. :** **[10]**

1. Name one reaction which is accompanied by the evolution of heat.
2. What is a redox reaction? Explain with an example.
3. What is a balanced chemical equation? Why should chemical equations be balanced?

4. Identify the substances that are oxidised and the substances that are reduced in the following reactions.
   i. $4Na(s) + O_2(g) \rightarrow 2Na_2O(s)$
   ii. $CuO(s) + H_2(g) \rightarrow Cu(s) + H_2O(l)$
5. Give one example of an oxidation-reduction reaction which is also:
   a. A combination reaction.
   b. A displacement reaction.

SECTION C

*** Answer short answer questions. [3 Mark each]** **[12]**

1. Explain the term "corrosion" with an example. Write a chemical equation to show the process of corrosion of iron.
2. Two carbon compounds X and Y have the molecular formula C_3H_6 and C_4H_{10} respectively. Which one of the two is most likely to show addition reaction? Justify your answer. Also give the chemical equation to explain the process of addition reaction in this case.
3. Define the following in terms of gain or loss of hydrogen with one example:
   i. Oxidation.
   ii. Reduction.
4. What happens when a zinc strip is dipped into a copper sulphate solution?
   a. Write the equation for the reaction that takes place.
   b. Name the type of reaction involved.

SECTION D

*** Long answer questions [5 Mark each]** **[10]**

1. Give one example each of a chemical reaction characterised by:
   i. Evolution of a gas.
   ii. Change in colour.
   iii. Formation of a precipitate.
   iv. Change in temperature.
   v. Change in state.
2. When water is added gradually to a white solid X, a hissing sound is heard and a lot of heat is produced forming a product Y. A suspension of Y in water is applied to the walls of a house during white washing. A clear solution of Y is also used for testing carbon dioxide gas in the laboratory.
   a. What could be solid X? Write its chemical formula.
   b. What could be product Y? Write its chemical formula.
   c. What is the common name of the solution of Y which is used for testing carbon dioxide gas?
   d. Write chemical equation of the reaction which takes place on adding water to slid X.
   e. Which characteristic of chemical reactions is illustrated by this example?

SECTION E

*** case - based/data -based questions** **[4]**

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

A reaction in which two or more reactants combine to form a single product is called a combination reaction. For example, calcium oxide reacts vigorously with water to form calcium hydroxide. The reaction is highly exothermic in nature, as lots of heat is produced during the reaction.

$$\underset{\text{Calcium oxide}}{CaO_{(s)}} + \underset{\text{Water}}{H_2O_{(l)}} \longrightarrow \underset{\text{Calcium hydroxide}}{Ca(OH)_{2(aq)}} + \text{Heat}$$

Solution of $Ca(OH)_2$ is used for white wash the walls. Calcium hydroxide reacts slowly with carbon dioxide in air to form a thin layer of calcium carbonate on the wall which gives a shiny appearance to wall. Calcium carbonate will form after two or three days of white wash.

i. What is the chemical name of quick lime?

ii. When carbon dioxide is passed through lime water, what will be the reaction?

iii. which reaction is formed when calcium oxide reacts vigorously with water?

OR

A) what is a combination reaction?

B) Which is an endothermic reaction?

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