



CHEMISTRY

BOOKS - ICSE

CHEMICAL REACTIONS

Exercises A Multiple Choice Questions

1. A chemical reaction may show the following characteristics.

- A. release of gas
- B. release of heat
- C. change in state
- D. all of the above

Answer: D



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2. Reaction between two compounds to form a new compound.

- A. combination
- B. decomposition
- C. single displacement
- D. double displacement

Answer: A

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3. Reaction in which one of the products is water.

- A. precipitation reaction
- B. decomposition reaction
- C. neutralizaion reaction

D. single displacement reaction

Answer: C



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4. If an oxide does not form salt when it reacts with acids or bases, it is called

A. basic

B. acidic

C. amphoteric

D. neutral

Answer: D



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5. Aluminium oxide is following type of an oxide.

- A. basic
- B. acidic
- C. amphoteric
- D. neutral

Answer: C

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Exercises B True Or False

1. A chemical reaction always involves absorption of energy.

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2. Non-metallic oxides can be acidic or neutral in nature.

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3. Copper metal can displace magnesium sulphate to give copper sulphate and magnesium.

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4. In an endothermic reaction energy absorbed is more than the energy released.

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5. NO is an acidic oxide, while NO_2 is a neutral oxide.

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Exercises C Fill In The Blanks

1. Carbonic acid is formed whenoxide reacts with water.

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2. reaction is also known as a substitution reaction.

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3. When magnesium ribbon burns in air to form magnesium oxide, it is a reaction.

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4. During photosynthesis, energy is And during burning, energy is

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5. Amphoteric oxides are Oxides that show both acidic and basic properties.

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Exercises D Match The Following

1. Match the following

Process	Type if re
1. Crumbling of chalk when heated	(a) single dis
2. Iron displacing copper from copper sulphate	(b) Decompo
3. Formation of an insoluble compound	(c) Exotherm
4. Energy released is more than the energy absorbed	(d) Endother
5. Dissolution of ammonium chloride(NH_4Cl) in water	(e) Precipita

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2. Reaction in which a great amount of energy is released to form new bonds.

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3. Oxides that react with acids to form salts.

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4. Oxides that react with both acids and bases are known as :

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5. A metal which is more reactive than calcium.

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Exercises F Diagram Based Questions

1. Give the type of reaction in figures (a), (b) and (c).



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2. Give an example of fig (b) taking silver chloride as the reactant.



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3. Explain fig. (c) by taking sodium chloride and silver nitrate as reactants.



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Exercises G Give Reasons For The Following

1. Atoms simply rearrange themselves during a chemical reaction.

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2. Displacement reactions help to predict the reactivity of elements.

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3. Electrolysis is considered to be an endothermic reaction.

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4. Explain: Neutralization plays an important role in the treatment of indigestion.

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Exercises H Short Answer Questions

1. State three characteristics that show a chemical reaction has occurred.

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2. Differentiate between combination and decomposition reaction with examples.

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3. What is the difference between displacement and double displacement reactions? Write equations for these reactions.

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4. Name two metals that can displace hydrogen from dilute acids to form metal salts and hydrogen gas.



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5. Explain with an example how displacement reactions help to distinguish between more reactive and less reactive elements.



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6. Give two differences between basic and acidic oxides along with examples.



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7. Give an example of an endothermic reaction.



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8. What are amphoteric oxides? Give two examples of amphoteric oxides.

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Test Yourself 1

1. A chemical reaction involves And Of bonds.

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2. Chemical reaction in which two elements combine to form a new compound is known as a Reactions.

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3. When electric current is passed through water, it undergoes a
Reaction.

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4. Single displacement reaction is also known as a reaction.

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5. Reaction between a base and an acid to form salt and water is known as a

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Test Yourself 2

- | | |
|---------------------------------------|-------------------------|
| 1. Net result is absorption of energy | a. Exothermic reaction |
| 2. Burning is this type of a reaction | b. Basic oxide |
| 1. 3. Oxides of metals | c. Acidic oxides |
| 4. Oxides of non-metals | d. Neutral oxide |
| 5. Water is an example of | e. Endothermic reaction |

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Check Your Progress Answer These Questions

1. Name the attractive forces that hold atoms or ions together to form molecules or compounds.

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2. Name the type of chemical reaction that occurs when magnesium ribbon is burned in air.

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3. What happens to limestone on heating?

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4. What type of chemical reaction is involved when silver chloride is exposed to light?

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5. Name the type of chemical reaction that occurs between a solution of sodium chloride and a solution of silver nitrate.

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6. What type of reaction is the following? acid + base \rightarrow salt + water

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Exercise Tick The Most Appropriate Answer

1. Attractive forces that hold atoms or ions together to form molecules or compounds are called

A. ionic bonds.

B. covalent bonds.

C. chemical bonds.

D. none of these

Answer:



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2. An atom that loses electrons becomes a positively-charged ion called

A. cation

B. anion

C. ion

D. all of these

Answer:



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3. When two atoms share electrons, they form a bond called

- A. ionic bond.
- B. covalent bond.
- C. chemical bond.
- D. electrovalent bond.

Answer:

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4. $2Mg(s) + O_2(g) \rightarrow 2MgO(s)$ is an example of a

- A. combination reaction.
- B. double displacement reaction.
- C. decomposition reaction.
- D. displacement reaction.

Answer:

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5. $AB \rightarrow A + B$ is the representation of a

- A. combination reaction.
- B. double displacement reaction.
- C. decomposition reaction.
- D. displacement reaction.

Answer:



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6. When chlorine gas is passed through an aqueous solution of potassium bromide, the solution turns brown due to the liberation of

- A. chlorine
- B. oxygen
- C. bromine

D. iodine

Answer:



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7. Solutions of silver nitrate and sodium chloride react to form a white precipitate of

A. sodium chloride.

B. silver nitrate.

C. sodium nitrate.

D. silver chloride.

Answer:



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8. Our stomach produces

- A. hydrochloric acid
- B. sulphuric acid
- C. nitric acid.
- D. none of these

Answer:



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9. As we move down the activity series, the reactivity of metals :

- A. increases
- B. does not change
- C. decreases
- D. varies

Answer:

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10. Chemical reactions in which heat energy is evolved are called

- A. endothermic reactions.
- B. decomposition reactions.
- C. displacement reactions.
- D. exothermic reactions.

Answer:

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Exercise Fill In The Blanks

1. Metals react with non-metals to form stable compounds called _____ compounds.

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2. An atom that gains electrons becomes a negatively-charged ion called _____

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3. The attractive force between oppositely charged ions that holds ions together is called an _____ bond.

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4. An acid turns blue litmus paper or solution _____

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5. Salts are compounds formed by the combination of an acid and a _____

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6. The most reactive metal is at the _____ of the activity series of metals.

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7. Chemical reactions in which heat is absorbed are called _____

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8. _____ are formed when metals or non-metals react with oxygen in the air.

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Exercise Match The Columns

1. Match the columns

- | | |
|--|---|
| 1. Electronegative ion | a. neutralization reaction |
| 2. Reaction between sodium hydroxide and hydrochloric acid | b. basic oxides |
| 3. Limestone on heating | c. show neither basic nor acidic properties |
| 4. Dissolution of ammonium chloride in water | d. exothermic reaction |
| 5. Oxides of metals | e. acidic oxides |
| 6. Oxides of non-metals | f. show both basic and acidic properties |
| 7. Amphoteric oxides | g. anion |
| 8. Neutral oxides | h. decomposition reaction |
| | i. endothermic reaction |

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Exercise Write True Or False Correct The False Statements

1. The attractive force between oppositely charged ions that holds ions together is called an _____ bond.

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2. When electricity is passed through acidified water, it decomposes to give hydrogen and carbon dioxide.

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3. Potassium chlorate on heating gives potassium chloride and oxygen.

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4. silver chloride \rightarrow silver + chlorine

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5. Neutralization reactions between acids and bases are endothermic reactions.

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6. When metal carbonates are heated strongly, metal oxides are formed.

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7. Acidic oxides that are dissolved in water turn red litmus blue.

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Exercise Name The Following

1. Substances that take part in a chemical reaction

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2. Name: Substances produced because of a reaction

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3. Stable compounds that are formed when metals react with non-metals

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4. Name: A reaction in which a substance breaks up into two or more simpler substances

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5. A reaction in which an element displaces another element from its compound

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6. A substance that alters the speed of a chemical reaction but does not take part in the reaction

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7. The insoluble residue formed when solutions of two compounds react with each other

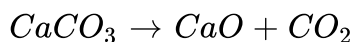
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8. Compounds that are formed when metals or non-metals react with oxygen in the air

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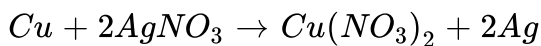
Exercise Classify The Following Reactions

1. Classify the following reactions as combination, displacement, decomposition or neutralization reactions.



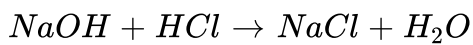
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2. Classify the following reactions as combination, displacement, decomposition or neutralization reactions.



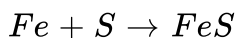
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3. Classify the following reactions as combination, displacement, decomposition or neutralization reactions.



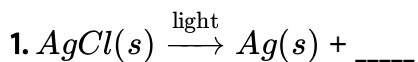
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4. Classify the following reactions as combination, displacement, decomposition or neutralization reactions.

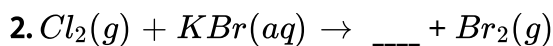


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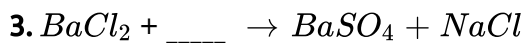
Exercise Complete The Following Chemical Equations And Balance Them



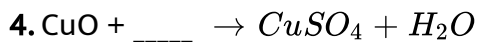
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Exercise Answer The Following In Short

1. What is a chemical reaction?

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2. Differentiate between an electrovalent bond and a covalent bond.

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3. What are double displacement reactions ?

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4. What is a neutralisation reaction? Give two examples.

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5. Differentiate between an acid and a base

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6. What type of reaction is governed by the position of a metal in the metal activity series?

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7. Differentiate between the following : Exothermic reaction and Endothermic reaction

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8. Name the types of oxides.

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Exercise Answer The Following In Detail

1. Name all the types of chemical reactions and write an example of each.

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2. Explain how the principle of a displacement reaction is based on the reactivity of metals and non-metals.

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3. Describe an experiment to study a neutralization reaction.

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4. Explain exothermic reactions with the help of examples.

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5. Describe the methods used to prepare oxides.

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6. Differentiate among acidic oxides, basic oxides, amphoteric oxides and neutral oxides.

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Think And Answer

1. Sodium chloride is an ionic compound. Why?

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2. The reaction between solutions of silver nitrate and sodium chloride is a precipitation reaction. Explain.

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3. The dissolution of quicklime in water is an exothermic reaction. Why?

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4. Acidic oxides that are dissolved in water turn blue litmus red. Why?

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5. Nitrous oxide is a neutral oxide. Explain.

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1. State why a direct combination reaction is called a-synthesis reaction.

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2. Differentiate between,- a. Direct combination reaction & a decomposition reaction b. Displacement reaction & a neutralization reaction.

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3. Classify the following reactions into- a. Direct combination b. Decomposition c. Displacement d. Double decomposition - The reactions are - i. Zinc hydroxide on heating gives zinc oxide & water ii. Zinc reacts with copper [II] sulphate to give zinc sulphate & copper iii. Zinc sulphate reacts with ammonium hydroxide to give ammonium sulphate & zinc

hydroxide iv. Molten zinc at high temperatures, burns in air to give zinc oxide.

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4. Give balance equations for -i. A direct combination reaction involving two elements, one of which is a non metal ii. A thermal decomposition reaction involving heat on limestone [calcium carbonate] iii. An electrolytic decomposition reaction involving a neutral liquid iv. A displacement reaction involving a metal above hydrogen in the activity series with copper [II] sulphate solution v. A double decomposition neutralization reaction involving an acid & a base vi. A white precipitate obtained during a double decomposition reaction involving a silver salt with a sodium salt.

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5. A chemical reaction may be reversible in nature. State the meaning of the term in italics. Give a reason why a catalyst is used in certain chemical

reactions. Give a balanced equation for the following - a. A reversible catalytic reaction involving-

i. nitrogen as one of the reactants ii. Sulphur dioxide as one of the reactants.

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6. State which type of chemical reactions proceed with - a. Evolution of heat energy b. Absorption of heat energy. State in each of the following reactions whether heat is evolved or absorbed - i. Water is added to quicklime ii. Two neutral gases on passage through an electric arc give nitric oxide iii. Two neutral gases combine to give - a basic gas.

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7. Certain thermal decomposition reactions, result in formation of oxides. Give balanced equations for the thermal decomposition of the following, which result in formation of a metallic oxide. A. Limestone b. Lead carbonate c. Calcium nitrate d. Calcium hydroxide.



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8. State the meaning of the term oxide. Give a balanced equation for formation of the following oxides- a. Sulphur dioxide from a non metal b. Zinc oxide from a metal c. Lead oxide from a mixed oxide.



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9. Give two examples each of the following oxides - a. Acidic oxides b. Basic oxides c. Amphoteric oxides d. Neutral oxides. State which of the following oxides i.e. a. to d. -

(i) React with water to give a base (ii) React with a base to give salt & water

(iii) React with acids & bases to give salt & water.



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10. Give one example each of - a. A peroxide b. A mixed oxide c. A dioxide.



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Objective Type Questions

1. Select the correct answer from A,B,C,D and E for each statement given below:

A. Iron B. Carbonic acid C. Hydrogen D. Oxygen E. Carbon monoxide

The product formed during direct combination reaction of carbon dioxide & water.



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2. Select the correct answer from A,B,C,D and E for each statement given below:

A. Iron B. Carbonic acid C. Hydrogen D. Oxygen E. Carbon monoxide

the neutral gas obtained on thermal decomposition of potassium nitrate.



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3. Select the correct answer from A,B,C,D and E for each statement given below:

A. Iron B. Carbonic acid C. Hydrogen D. Oxygen E. Carbon monoxide

The displaced product of the displacement reaction of sodium with cold water.

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4. Select the correct answer from A,B,C,D and E for each statement given below:

A. Iron B. Carbonic acid C. Hydrogen D. Oxygen E. Carbon monoxide

The catalyst used in the catalytic reaction involving the reactants nitrogen & hydrogen.

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5. Select the correct answer from A,B,C,D and E for each statement given below:

A. Iron B. Carbonic acid C. Hydrogen D. Oxygen E. Carbon monoxide

A neutral oxide which does not react with an acid or a base to give salt & water.

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6. Complete the statements by filling in the blank with the correct word/s:

Direct combination reaction of phosphorus pentoxide with water gives _____ [H_3PO_3 / H_3PO_4]

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7. Complete the statements by filling in the blank with the correct word/s:

Decomposition of silver salts in the presence of sunlight is an example of _____ [double decomposition/photochemical decomposition]

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8. Complete the statements by filling in the blank with the correct word/s:

The element molybdenum used in the reaction of nitrogen with hydrogen at elevated temperatures is an example of a _____ [promoter/catalyst].

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9. Complete the statements by filling in the blank with the correct word/s:

The reaction of coke with steam to give water gas is an example of an _____ [exothermic/endermotic] reaction.

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10. Complete the statements by filling in the blank with the correct word/s:

The metal which reacts with steam and the reaction is reversible is _____ [calcium/iron]

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11. Give a balanced equation for each of the following types of reaction:

A thermal decomposition reaction in which a compound decomposes to give two new compounds.

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12. Give a balanced equation for each of the following types of reaction:

A reaction of direct combination i.e. synthesis in which two gases combine to give another gas-which turns lime water milky.

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13. Give a balanced equation for each of the following types of reaction:

A thermal decomposition reaction in which a metallic nitrate decomposes to give - a basic oxide.

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14. Give a balanced equation for each of the following types of reaction:

A catalytic, reversible, exothermic reaction.

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15. Give a balanced equation for each of the following types of reaction:

A displacement reaction in which a metal above hydrogen in the reactivity series, displaces another metal from the solution of its compound.

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16. Differentiate between the following: Thermal decomposition & thermal dissociation.

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17. Differentiate between the following: Neutralization reaction & a precipitation reaction.

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18. Differentiate between the following: Electrolytic decomposition & photochemical decomposition.

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19. Differentiate between the following: A catalyst & a promoter.

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20. Differentiate between the following: An acidic oxide & a basic oxide.

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21. Match the chemical reactions in List I with the appropriate answer in

List II.

List I

1. $XY \xrightleftharpoons{\text{heat}} X + Y$
2. $XY \rightarrow X + Y$
3. $X^+Y^- + A^+B^- \rightarrow X^+B^- + A^+Y^-$
4. $X + YZ \rightarrow XZ + Y$
5. $X + Y \xrightarrow{\text{heat}} XY - \Delta$

List II

- A: Displacement reaction
- B: Double decomposition
- C: Endothermic reaction
- D: Thermal dissociation
- E: Decomposition reaction



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