

## UNIQUE **STUDY** POINT

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**Most important questions class x science**

### CHAPTER 1.

#### CHEMICAL REACTIONS ANS EQUATIONS

#### MULTIPLE CHOICE QUESTIONS:

Q.1. Some crystals of copper sulphate were dissolved in water. The color of the solution obtained would be:

- (a) Green      (b) Red      (c) Blue      (d) Brown

Q.2. When Zinc pieces are added to dilute HCl taken in a test tube, then:

- (a) No change takes place  
(b) The colour of the solution becomes yellow.  
(c) A pungent smelling gas gets liberated  
(d) Small bubbles of H<sub>2</sub> gas appear on the surface of zinc pieces

Answers at last Page

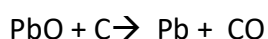
Q.3. PbS reacts with ozone (O<sub>3</sub>) and forms PbSO<sub>4</sub>. As per the balanced equation, molecules of ozone required for every one molecule of PbS is/are:

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

Q.4. Chemically rust is:

- (a) Hydrated ferrous oxide      (b) Hydrated ferric oxide  
(c) Only ferric oxide      (d) None of these

Q.5. In the reaction:



- (a) PbO is oxidised      (b) C acts as an oxidising agent  
(c) Carbon acts as a reduction agent      (d) Reaction does not represent redox reaction.

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Q.6. A substance which oxidizes itself and reduces other is known as:

- (a) Oxidising agent
- (b) Reducing agent
- (c) Both (a) and (b)
- (d) None of these.

Q.7. The reaction between lead nitrate and potassium iodide present in aqueous solution is an example of

- (a) Decomposition Reaction
- (b) Displacement Reaction
- (c) Double Displacement Reaction
- (d) Neutralisation Reaction

Q.8. What happens when dilute hydrochloric acid is added to iron filling? Tick the correct answer

- (a) Hydrogen gas and iron chloride are produced.
- (b) Chlorine gas and iron hydroxide are produced
- (c) No reaction takes place
- (d) Iron salt and water are produced

Q.9. A student adds lead and silver to two different test tubes containing an equal amount of Copper Sulphate solution. The student observes that the color of the solution in the test tube with lead changes. What explains the change in the color of the solution?

- (a) A displacement reaction takes place as lead replaces copper from the solution.
- (b) A combination reaction takes place as lead combines with sulphate in the solution.
- (c) Decomposition reaction takes place as copper dissociates from sulphate in the solution.
- (d) A double displacement reaction takes place as copper dissociates from sulphate and lead combines with sulphate in the solution.

Q. 10. In an electrolytic cell where electrolysis is carried, cathode has:

- (a) Positive charge
- (b) Negative charge

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(c) Connected to negative terminal of the battery (d) None of these is correct.

Q.11. 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

Q.12. Which of the following is not a balanced equation?

- (a)  $\text{Fe} + \text{Cl}_2 \rightarrow \text{FeCl}_3$  (b)  $\text{Mg} + \text{CuSO}_4 \rightarrow \text{MgSO}_4 + \text{Cu}$   
(c)  $\text{NaOH} + \text{HCl} \rightarrow \text{NaCl} + \text{H}_2\text{O}$  (d)  $\text{Zn} + \text{S} \rightarrow \text{ZnS}$

Q.13. Dissolving sugar is an example of:

- (a) Physical change (b) Chemical change  
(c) Redox reaction (d) None of these

Q.14. We store silver chloride in dark colored bottles because it is

- (a) A white solid (b) Undergoes redox reaction  
(c) To avoid action by sunlight (d) None of the above.

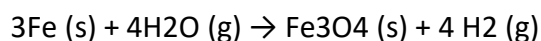
Q.15. The reaction  $\text{H}_2 + \text{Cl}_2 \rightarrow 2 \text{HCl}$  represents:

- (a) oxidation (b) reduction (c) decomposition (d) combination

Q.16. Copper displaces which of the following metals from its salt solution:

- (a)  $\text{ZnSO}_4$  (b)  $\text{FeSO}_4$  (c)  $\text{AgNO}_3$  (d)  $\text{NiSO}_4$

Q.17. Which of the following statements about the given reaction are correct?



- (i) Iron metal is getting oxidised  
(ii) Water is getting reduced

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(iii) Water is acting as reducing agent

(iv) Water is acting as oxidising agent

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

(b) (ii) and (iv)

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

(d) (ii) and (iv)

Q.18. 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) Lead acetate

(c) Ammonium nitrate

(d) Potassium sulphate

Q.19. 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)  $\text{KMnO}_4$  is an oxidising agent, it oxidises  $\text{FeSO}_4$ .

(b)  $\text{FeSO}_4$  acts as an oxidising agent and oxidises  $\text{KMnO}_4$ .

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

(d)  $\text{KMnO}_4$  is an unstable compound and de-composes in presence of  $\text{FeSO}_4$  to a colourless compound

Q.20. In an electric cell where electrolysis is carried out, anode has:

(a) Positive charge

(b) Negative charge

(c) Connected to negative terminal of the battery

(d) None of these is correct

### ASSERTION- REASON QUESTIONS :

**DIRECTION:** Each of these questions contains an Assertion followed by Reason. Read them carefully and

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answer the question on the basis of following options. You have to select the one that best describes the two statements.

- (a) If both Assertion and Reason are correct and Reason is the correct explanation of Assertion.
- (b) If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.
- (c) If Assertion is correct but Reason is incorrect.
- (d) If Assertion is incorrect but Reason is correct

Q.1. **Assertion:** Stannous chloride is a powerful oxidising agent which oxidises mercuric chloride to mercury.

**Reason:** Stannous chloride gives grey precipitate with mercuric chloride, but stannic chloride does not do so.

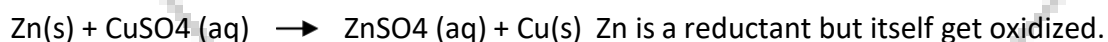
Ans : (c) Assertion is correct but Reason is incorrect

Q. 2. **Assertion:** Corrosion of iron is commonly known as rusting.

**Reason:** Corrosion of iron occurs in presence of water and air.

Ans : (b) Both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.

Q. 3. **Assertion:** In a reaction.



**Reason:** In a redox reaction, oxidant is reduced by accepting electrons and reductant is oxidized by losing electrons.

Ans: (a) Both Assertion and Reason are correct and Reason is the correct explanation of Assertion.

Q. 4. **Assertion:** A reducing agent is a substance which can either accept electron.

**Reason:** A substance which helps in oxidation is known as reducing agent.

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Ans : (d) Assertion is incorrect but Reason is correct

Q. 5. **Assertion:** The balancing of chemical equations is based on law of conservation of mass.

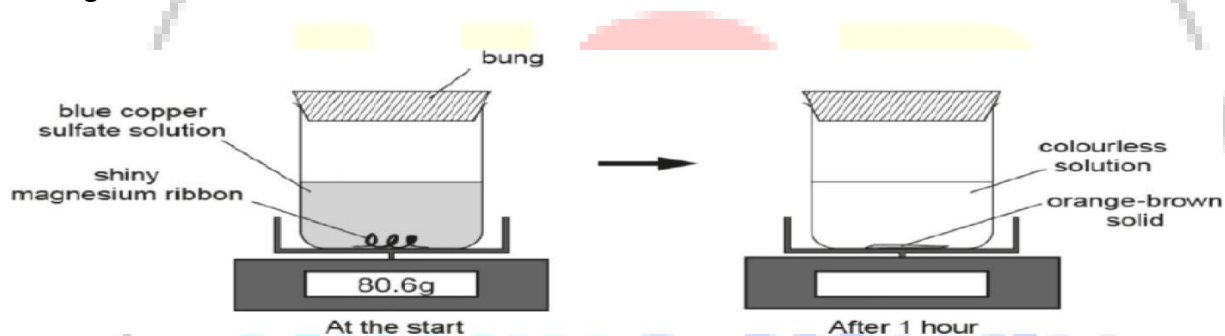
**Reason:** Total mass of reactants is equal to total mass of products.

Ans : (a) Both Assertion and Reason are correct and Reason is the correct explanation of Assertion.

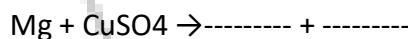
### CASE STUDY BASED QUESTIONS:

Q.1. Read the following and answer the questions :

A student was asked to investigate what happens when a piece of shiny magnesium ribbon is added to copper sulphate solution. The apparatus was set up as shown below. The mass was recorded at the start and again after one hour.



1.1. Complete the equation:



(a)  $\text{MgSO}_4 + \text{Cu}$

(c)  $\text{MgS} + \text{Cu}_2\text{O}$

(b)  $\text{MgO} + \text{Cu}$

(d)  $\text{MgSO}_3 + \text{Cu}_2\text{O}$

1.2. Choose from below the name given to this type of reaction:

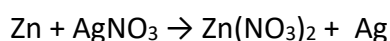
(a) Combustion

(b) Displacement

(c) Corrosion

(d) Electrolysis

1.3. Balance the following symbol equation that represents the displacement reaction that takes place between zinc and silver nitrate solution.

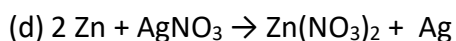
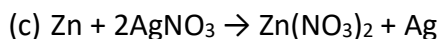
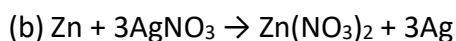
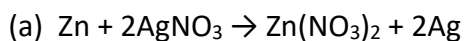


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1.4. The experiment was repeated using sodium sulphate solution instead of copper sulphate solution.

No reaction took place. Put the metals copper, magnesium and sodium in order of reactivity.

(a) I. Sodium II Copper III Magnesium

(b) I Magnesium II Copper III Sodium

(c) I. Copper II. Magnesium III. Sodium

(d) I. Sodium II. Magnesium III. Copper

1.5. What will be the mass of the beaker and content after 1 hour?

(a.) More than 80.6 g

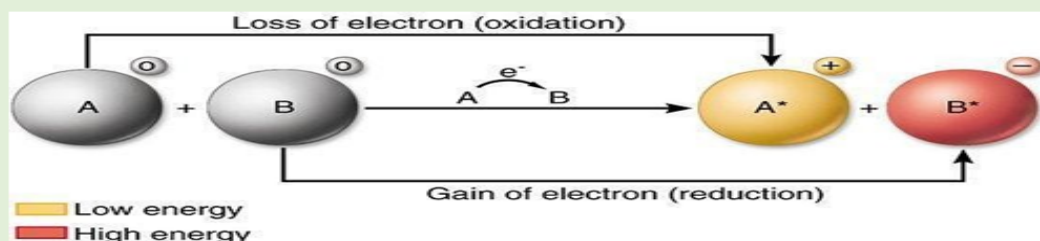
(b) Equal to 80.6 g

(c) Less than 80.6 g

(d) None of the above

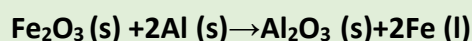
Q.2. Read the following and answer the questions :

The redox reaction is basically the contraction of reduction oxidation reaction. This type of reaction consists of a reduction and an oxidation that is coupled so that the oxidation part releases the electrons to be used in the reduction part. Therefore, all reactions that change the oxidation numbers are therefore redox reactions.



Called the reducing agent; when the reaction occurs, it reduces the other species. In other words, what is oxidized is the reducing agent and what is reduced is the oxidizing agent.

A good example of a redox reaction is the thermite reaction, in which iron atoms in ferric oxide lose (or give up) O atoms to Al atoms, producing  $\text{Al}_2\text{O}_3$ .



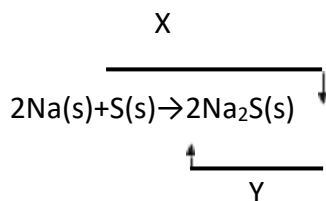
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2.1. Which of the following is correct code for X and Y in the following reaction?



- (i) x=oxidation reaction, y=reduction reaction
  - (ii) x=gain of two electrons, y=loss of two electrons,
  - (iii) x=reduction reaction, y=oxidation reaction
  - (iv) x=loss of two electrons, y=gain of two electrons
- (a)(i) and (ii)  
(b)(i) and (iv)  
(c) (ii) and (iii)  
(d)(iii) and (iv)

2.2. A substance which oxidizes itself and reduces other is known as:

- (a) Oxidizing agent
- (b) Reducing agent
- (c) Both of these
- (d) None of these

2.3. 'Thermite is a pyrotechnic composition of metal powder, which serves as fuel, and metal oxide.

When ignited by heat, thermite undergoes a reaction between iron and Aluminum Oxide and is used in the welding of railway tracks. The type of reaction is called:

- a.) Reduction
- b.) Oxidation
- c.) Redox
- d.) Decomposition

2.4. "Redox reactions can occur relatively slowly, as in the formation of rust, or much more rapidly, as in the case of burning fuel"



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Rusting and combustion are quite different. Which of the following lines is not the correct explanation for this?

- (a) Rusting occurs at the surface of iron to form a layer of rust.
- (b) Rusting gives out lots of heat and light.
- (c) Rusting is an example of slow oxidation.
- (d) It can be hampered by applying paint.

2.5. Reduction can be defined as:

- (a) Gain of electrons
- (b) Gain of Oxygen
- (c) Loss of Hydrogen
- (d) Loss of electrons

**Q.3. Read the following and answer the questions :**

Oxidation is the process of gaining of oxygen, or losing of hydrogen. Reduction is the process of losing of oxygen or gaining of hydrogen. The substance which undergoes oxidation is the reducing agent while the substance which undergoes reduction is known as the oxidising agent. Oxidation and reduction always take place together and these types of reactions are known as redox reactions.

Some of the examples of redox reactions are given below:

3.1. Give two examples of oxidation reaction from your everyday life.

3.2. Write the oxidising agent in the reaction III and VI.

3.3. Which of the following is an oxidising agent?

- (a)  $\text{LiAlH}_4$
- (b) Alkaline  $\text{KMnO}_4$
- (c) Acidified  $\text{K}_2\text{Cr}_2\text{O}_7$
- (d) Both (b) and (c)

3.4. Out of oxidation and reduction, which reaction takes place at anode?

3.5. Which substance undergoes reduction?

**Q.4. Read the following and answer the questions :**

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A chemical reaction is a representation of chemical change in terms of symbols and formulae of reactants and products. There are various types of chemical reactions like combination, decomposition, displacement, double displacement, oxidation and reduction reactions. Reactions in which heat is released along with the formation of products are called exothermic chemical reactions. All combustion reactions are exothermic reactions.

4.1. The chemical reaction in which a single substance breaks down into two or more simpler substances upon heating is known as

- (a) thermal decomposition reaction
- (b) photo decomposition reaction
- (c) electric decomposition reaction
- (d) both (a) and (c)

4.2 The massive force that pushes the rocket forward through space is generated due to the

- (a) combination reaction
- (b) decomposition reaction
- (c) displacement reaction
- (d) double displacement reaction

4.3. A white salt on heating decomposes to give brown fumes and yellow residue is left behind. The yellow residue left is of

- (a) lead nitrate
- (b) nitrogen oxide
- (c) lead oxide
- (d) oxygen gas

4.4 Which of the following reactions represents a combination reaction?

- (a)  $\text{CaO (s)} + \text{H}_2\text{O (l)} \rightarrow \text{Ca(OH)}_2 \text{ (aq)}$
- (b)  $\text{CaCO}_3 \text{ (s)} \rightarrow \text{CaO (s)} + \text{CO}_2 \text{ (g)}$
- (c)  $\text{Zn (s)} + \text{CuSO}_4 \text{ (aq)} \rightarrow \text{ZnSO}_4 \text{ (aq)} + \text{Cu (s)}$
- (d)  $2\text{FeSO}_4 \text{ (s)} \rightarrow \text{Fe}_2\text{O}_3 \text{ (s)} + \text{SO}_2 \text{ (g)} + \text{SO}_3 \text{ (g)}$

4.5. Complete the following statements by choosing correct type of reaction for X and Y.

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**Statement 1:** The heating of lead nitrate is an example of 'X' reaction.

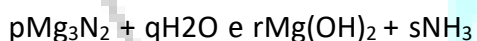
**Statement 2:** The burning of magnesium is an example of 'Y' reaction.

- (a) X- Combination, Y- Decomposition
- (b) X- Decomposition, Y-Combination
- (c) X- Combination, Y-Displacement
- (d) X- Displacement, Y-Decomposition

**Q.5. Read the following and answer the questions :**

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.

5.1. Consider the following reaction:



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

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

5.2. 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

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- (c) Number of atoms/molecules of the reactants and products formed
- (d) Whether a particular reaction is actually feasible or not
- 5.3. 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)
- 5.4. 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)  $4\text{NH}_3 + 5\text{O}_2 \rightarrow 4\text{NO} + 6\text{H}_2\text{O}$
- 5.5. 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 involved in a reaction.
- (d) All the above.

### VERY SHORT ANSWER TYPE QUESTIONS:

Q.1. What is a redox reaction?

Ans: A redox reaction can be defined as a chemical reaction in which electrons are transferred between two reactants participating in it.

Q.2. Why is photosynthesis considered as an endothermic reaction?

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Ans: Photosynthesis is considered an endothermic reaction, because during the process of photosynthesis, energy from the sun or sunlight is being absorbed.

Q.3. In electrolysis of water, why is the volume of gas collected over one electrode double that of the other electrode?

Ans: The amount of H is double than that of O. The two electrodes collect H<sub>2</sub> and O<sub>2</sub> separately, therefore, the volume of gas collected in one electrode is double the volume of gas collected in the other electrode.

Q.4. What happens when water is added to solid calcium oxide taken in a container? Write a chemical formula for the same.

Ans: When calcium oxide is added to water it forms calcium hydroxide Called slaked lime.

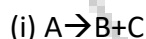
$\text{CaO} + \text{H}_2\text{O} \rightarrow \text{Ca}(\text{OH})_2$  The reaction between water and CaO is an exothermic reaction.

Q.5. Name the compound used for testing CO<sub>2</sub> gas.

Ans: Calcium hydroxide solution (freshly prepared), also called lime water, is used to test CO<sub>2</sub> gas.

### SHORT ANSWER TYPE QUESTIONS:

Q.1 Identify the type of chemical reaction



Ans. (i) Decomposition reaction

(ii) Double displacement reaction

Q.2. Why does not silver evolve hydrogen on reacting with dil. H<sub>2</sub>SO<sub>4</sub>?

Ans. Silver do not evolve hydrogen on reacting with dil. H<sub>2</sub>SO<sub>4</sub> as silver is less reactive metal than hydrogen.

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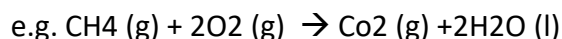
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Q.3 . Why a combustion reaction an oxidation reaction?

Ans. Combustion reaction because it is always carried out in the presence of air or oxygen for



Q.4. A student took 2-3 g of a substance X in a glass beaker & poured water over it slowly. He observed bubbles along with hissing noise. The beaker becomes quite hot. Identify X. What type of reaction is it?

Ans. X = Calcium oxide (Quick lime), Combination reaction.

Q.5 Why should a magnesium ribbon be cleaned before burning in air?

Ans. Magnesium ribbon is cleaned before burning to remove the protective layer of basic magnesium Oxide from the surface of magnesium ribbon.

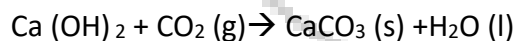
### LONG ANSWER TYPE QUESTIONS

Q.1. A student dropped few pieces of marble in dilute hydrochloric acid contained in a test tube. The evolved gas was then passed through lime water. What change would be observed in lime water? Write balanced chemical equation for both the change observed?

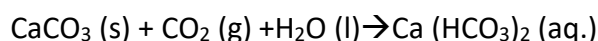
Ans: When marble ( $\text{CaCO}_3$ ) reacts with dil. HCl,  $\text{CO}_2$  gas evolved



When this gas is evolved and is passed through lime water, becomes milky due to the formation of insoluble Calcium carbonate.



But when milky disappears i.e. when  $\text{CO}_2$  gas is passed in excess through  $\text{CaCO}_3 (\text{s})$



Q.2. An aqueous solution of metal nitrate P reacts with sodium bromide solution to form Yellow ppt of compound Q which is used in photography. Q on exposure to sunlight undergoes decomposition

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reaction to form metal present in P along with reddish brown gas. Identify P & Q. Write the chemical reaction & type of chemical reaction and define it?

Ans: P = Ag NO<sub>3</sub> Q= AgBr     $2\text{AgBr} \rightarrow 2\text{Ag} + \text{Br}_2$

Photochemical decomposition.

The decomposition reaction that occurs in the presence of light is photochemical reaction.

Q.3. What happens to lime water when CO<sub>2</sub> gas is bubbled through it in excess?

Ans: When CO<sub>2</sub> gas is bubbled through lime water in excess then initially it becomes milky but after some time its milkiness disappears. This is because initially calcium carbonate is formed which causes the lime water to turn milky and when further CO<sub>2</sub> is passed calcium bicarbonate is formed which turns the solution colorless.

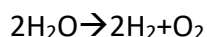
Q.4. A substance X used for coating iron articles is added to a blue solution of a reddish-brown metal Y, the colour of the solution gets discharged. Identify X and Y & also the type of reaction.

Ans: Here, a substance X used for coating iron articles is added to a blue solution of a reddish-brown metal Y, the colour of the solution gets discharged. Therefore, X is Iron ( Fe ) Y is Copper ( Cu ). Also, it is a type of a displacement reaction.

Q.5. A compound 'X' is used for drinking, has pH =7. Its acidified solution undergoes decomposition in presence of electricity to produce gases 'Y' and 'Z'. The volume of Y is double than Z. Y is highly combustible whereas Z is supporter of combustion. Identify X, Y & Z and write the chemical reactions involved.

Ans: In the given situation, X= H<sub>2</sub>O, 2Y =H<sub>2</sub> and Z=O<sub>2</sub>.

The chemical reaction involved is:



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### ANSWER KEY

#### MCQ

Q1.C	Q2.D	Q3.A	Q4,B	Q5.C
Q6.B	Q7.C	Q8.A	Q9.B	Q10.A
Q11.D	Q12.A	Q13.A	Q14.C	Q15.D
Q16.C	Q17.C	Q18.B	Q19.A	Q20.A

### ASSERTION AND REASONING

Q1.C	Q2.B	Q3.A	Q4.D	Q5.A
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### CASE STUDY BASED QUESTIONS

1.1. A	1.2.B	1.3. A	1.4. D	1.5. B
2.1.B	2.2.B	2.3.C	2.4.B	2.5.A
3.1 corrosion & rancidity	3.2 CuSO <sub>4</sub> in (III) & CuO in(VI)	3.3 D	3.4 oxidation	3.5 oxidizing agent
4.1 A	4.2 B	4.3 C	4.4 A	4.5 B
5.1 B	5.2 D	5.3 C	5.4 B	5.5 D