

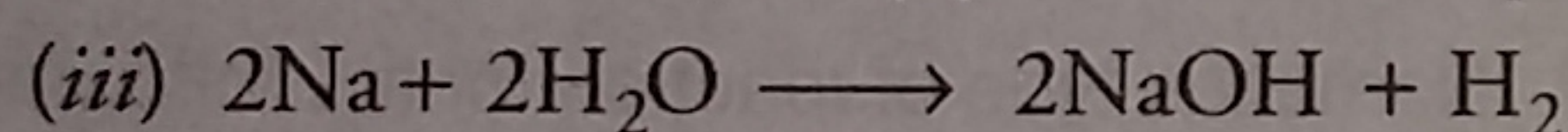
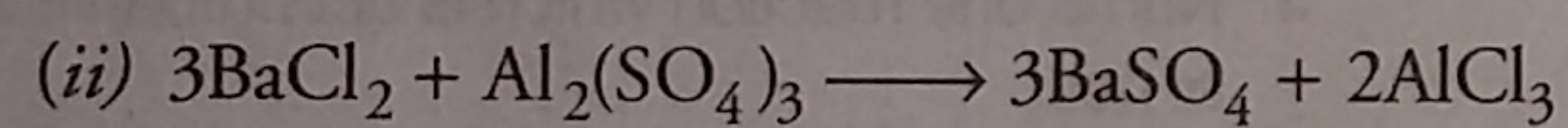
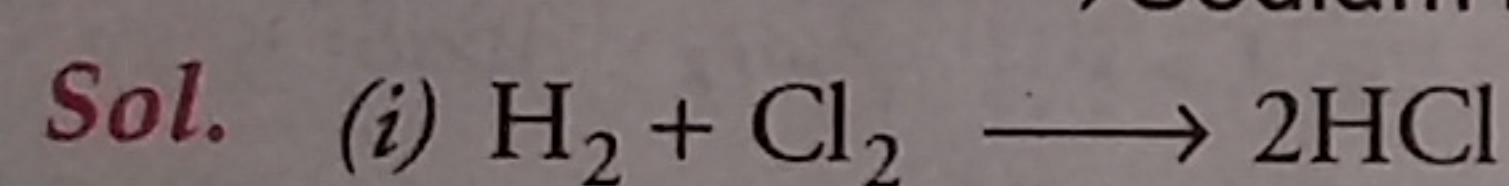
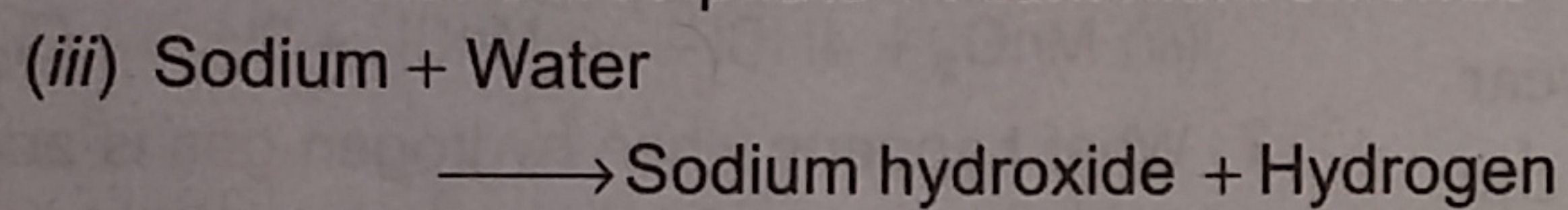
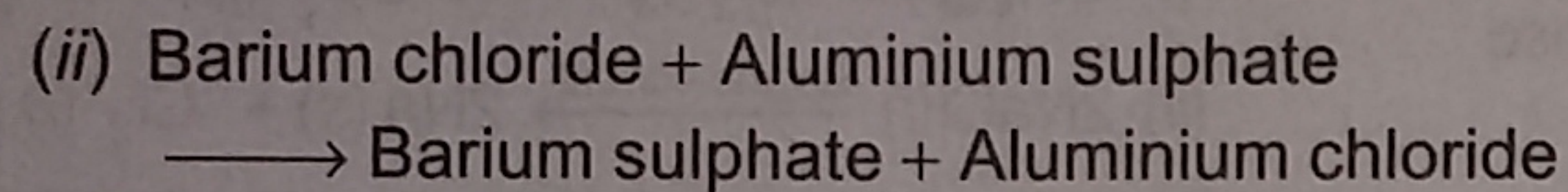
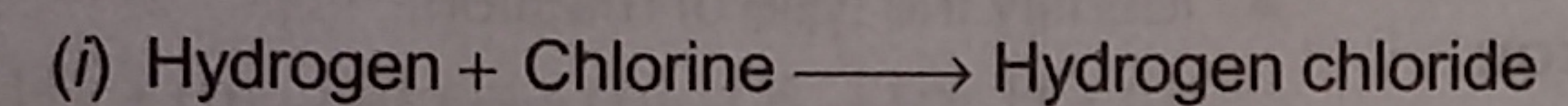
NCERT FOLDER

Text Questions

1 Why should a magnesium ribbon be cleaned before burning in air? **Pg 6**

Sol. Magnesium ribbon reacts with oxygen present in air to form a protective and inert layer of magnesium oxide on its surface. This layer is unreactive and prevents the ribbon from burning. Hence, it needs to be cleaned with sand paper before burning in air.

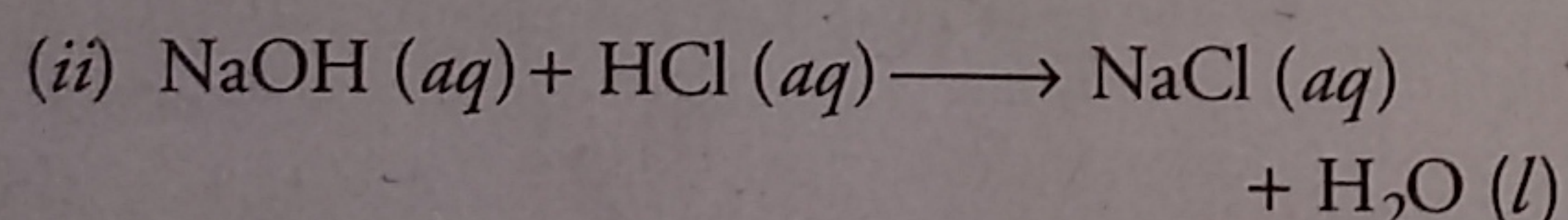
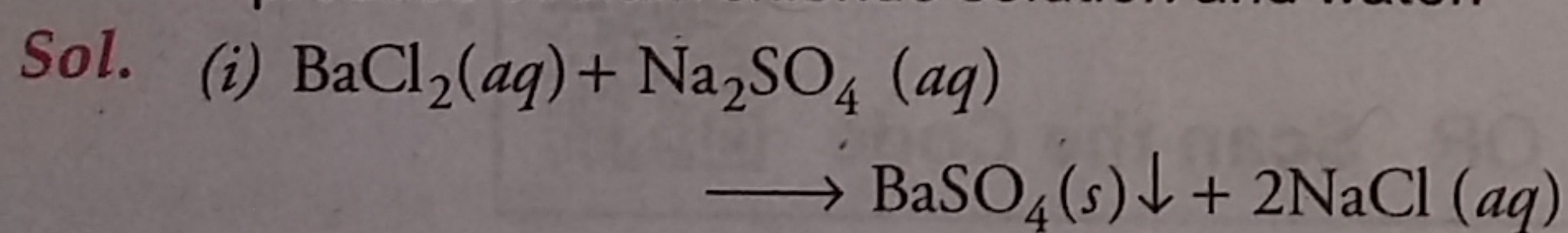
2 Write the balanced equation for the following chemical reactions: **Pg 6**



3 Write a balanced chemical equation with state symbols for the following reactions: **Pg 6**

(i) Solutions of barium chloride and sodium sulphate in water react to give insoluble barium sulphate and the solution of sodium chloride.

(ii) Sodium hydroxide solution (in water) reacts with hydrochloric acid solution (in water) to produce sodium chloride solution and water.



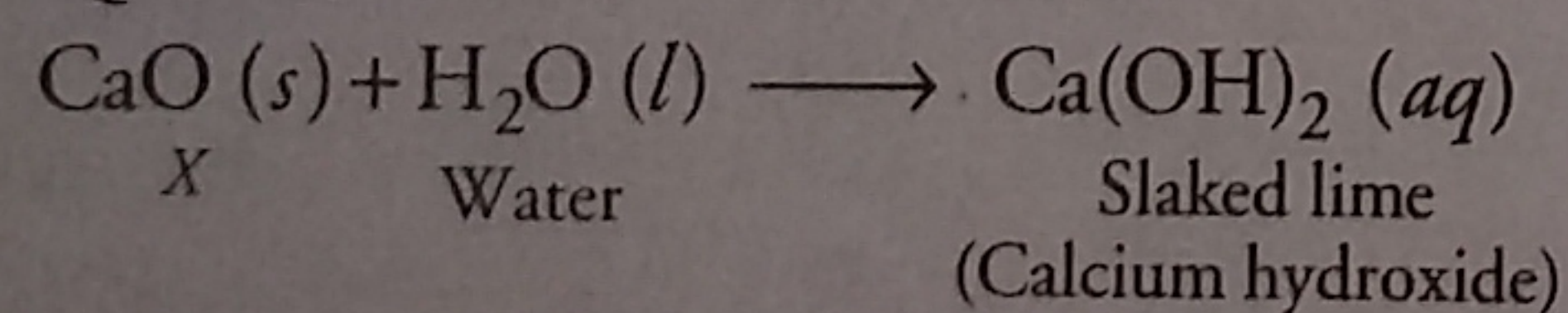
4 A solution of a substance 'X' is used for white washing.

(i) Name the substance 'X' and write its formula.

(ii) Write the reaction of the substance 'X' named in (i) above with water. **Pg 10**

Sol. (i) Substance X is calcium oxide or quicklime. Its formula is CaO

(ii) Quicklime reacts with water as:

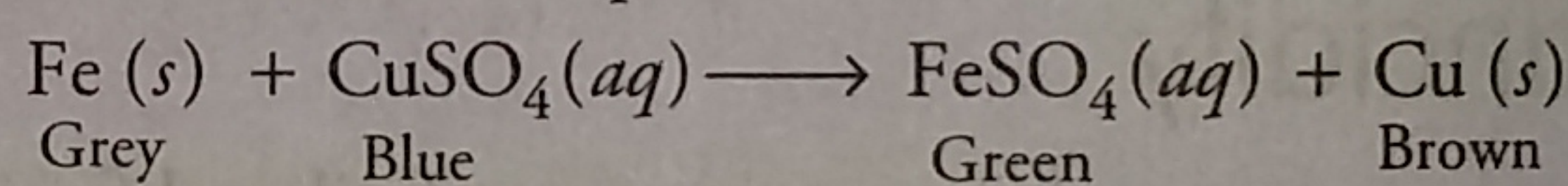


5 Why is the amount of gas collected in one of the test tubes in activity 1.7 (electrolysis of water) double of the amount collected in the other? Name this gas. **Pg 10**

Sol. The composition of water, i.e. the chemical formula H_2O , suggests that the molar ratio of hydrogen and oxygen is 2 : 1. Therefore, when water is electrically decomposed, the constituent gases hydrogen and oxygen are produced in the same molar ratio, 2 : 1. Thus, the amount (volume) of hydrogen gas is double than that of oxygen gas. So, this gas is hydrogen.

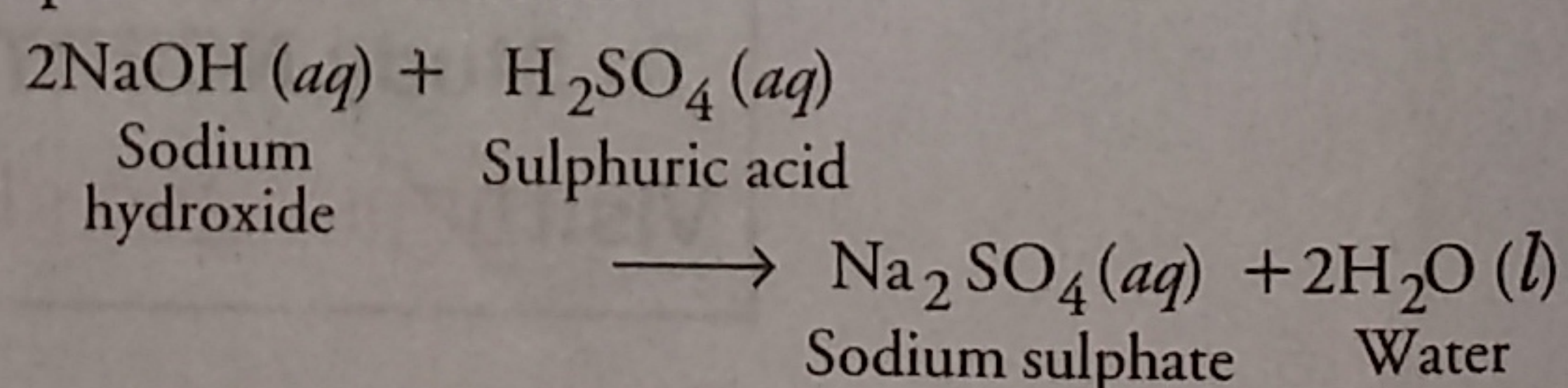
6 Why does the colour of copper sulphate solution change when an iron nail is dipped in it? **Pg 13**

Sol. The colour of copper sulphate solution changes when an iron nail is dipped in it because iron being more reactive than copper, displaces copper metal from aqueous copper sulphate solution. Thus, blue colour of copper sulphate fades away to give green colour solution of ferrous sulphate.

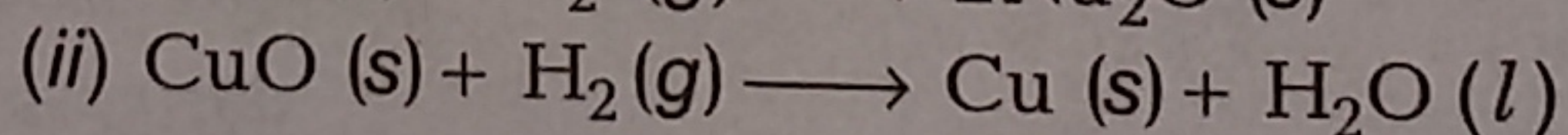
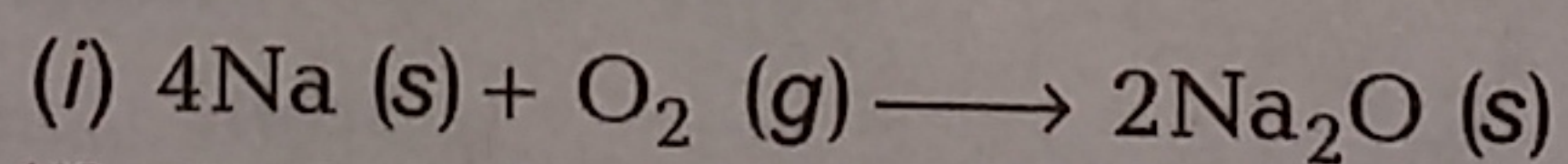


7 Give an example of a double displacement reaction other than the reaction of barium chloride with sodium sulphate. **Pg 13**

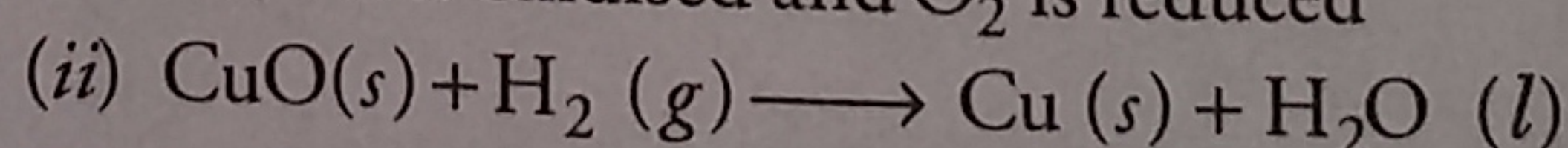
Sol. The following reaction is an example of a double displacement reaction:



8 Identify the substances that are oxidised and the substances that are reduced in the following reactions. **Pg 13**



Sol. (i) $4\text{Na}(s) + \text{O}_2(g) \longrightarrow 2\text{Na}_2\text{O}(s)$
Na has gained oxygen and forms Na_2O .
So, Na is oxidised and O_2 is reduced

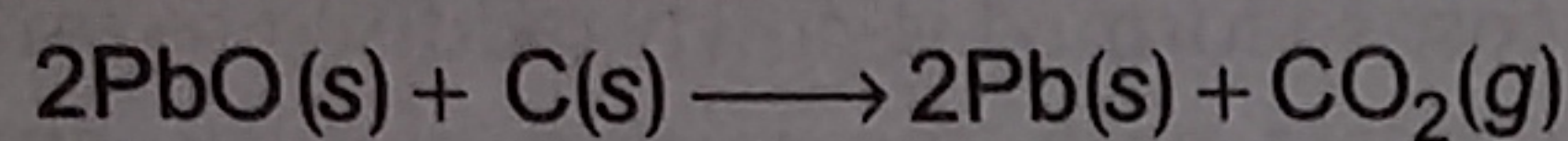


CuO has lost oxygen and forms Cu.
So, Cu is reduced while H_2 has gained oxygen, hence, it is oxidised.

Exercises

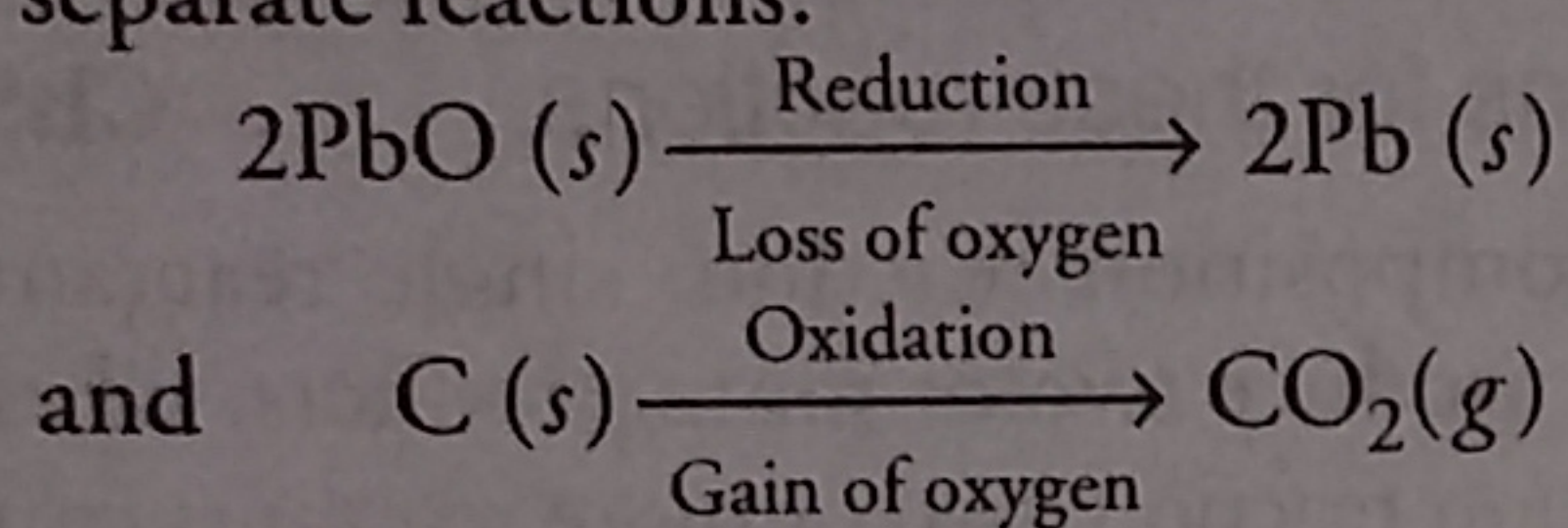
Pages 14, 15 and 16)

1 Which of the statements about the reaction below are incorrect?

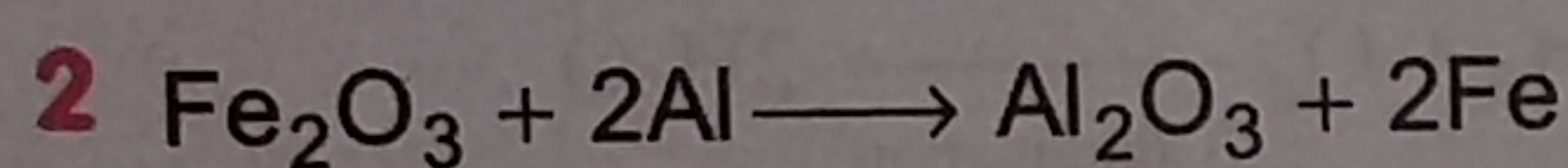


- (i) Lead is getting reduced
- (ii) Carbon dioxide is getting oxidised
- (iii) Carbon is getting oxidised
- (iv) Lead oxide is getting reduced

Sol. The given reaction can be written in the form of two separate reactions:



Therefore, (i) and (ii) are incorrect, while (iii) and (iv) are correct statements.



The above reaction is an example of a

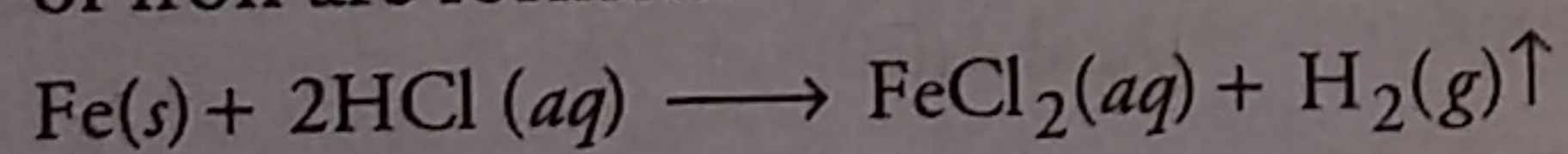
- (i) combination reaction
- (ii) double displacement reaction
- (iii) decomposition reaction
- (iv) displacement reaction

Sol. (iv) In the above reaction, Al is more reactive than Fe. So, it displaces Fe from Fe_2O_3 to form Al_2O_3 . Hence, it is a displacement reaction.

3 What happens when dilute hydrochloric acid is added to iron filings? Tick the correct answer.

- (i) Hydrogen gas and iron chloride are produced
- (ii) Chlorine gas and iron hydroxide are produced
- (iii) No reaction takes place
- (iv) Iron salt and water are produced

Sol. (i) Iron being more reactive than hydrogen, displaces hydrogen from the dilute hydrochloric acid. Thus, hydrogen gas and iron chloride a salt of iron are formed.



4 What is a balanced chemical equation? Why should chemical equations be balanced?

Sol. A chemical change is represented by a chemical equation. When the number of atoms of different elements on reactant and product side are equal, then the chemical equation is called a balanced chemical equation.

It is important to balance a chemical equation because

- (i) to validate the law of conservation of mass which states that the mass of reactants should be equal to the mass of the products. The total mass of a system is thus conserved.

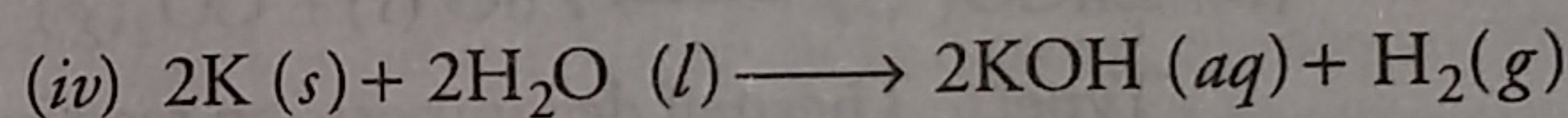
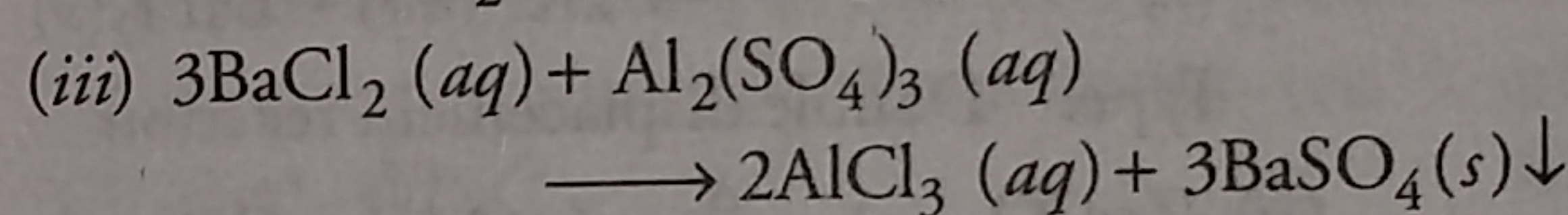
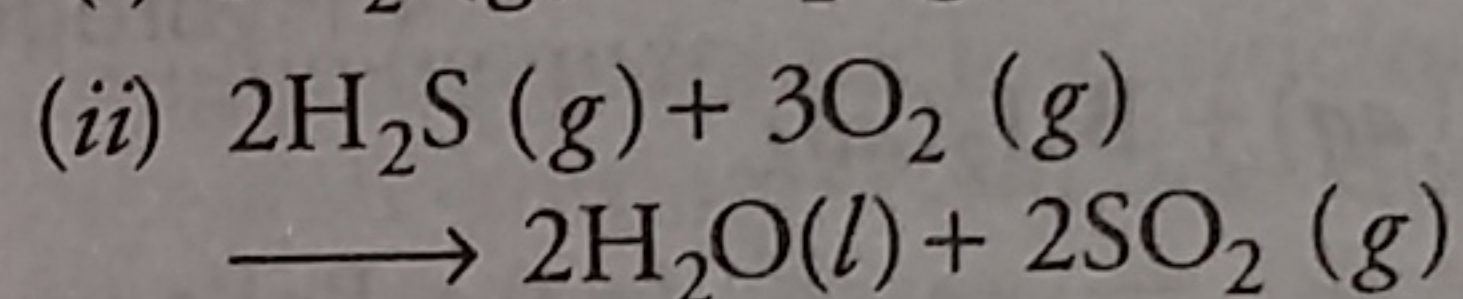
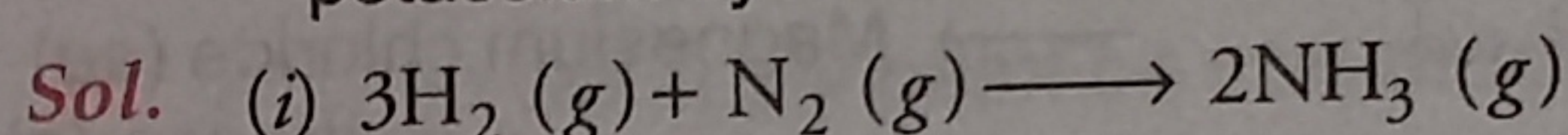
This law holds true only if number of atoms of reactants reacting together is equal to number of product atoms formed.

- (ii) a balanced chemical equation tells us about the physical state of the reactants and products whether they are solid (s), liquid (l) or gas (g) or aqueous (aq).

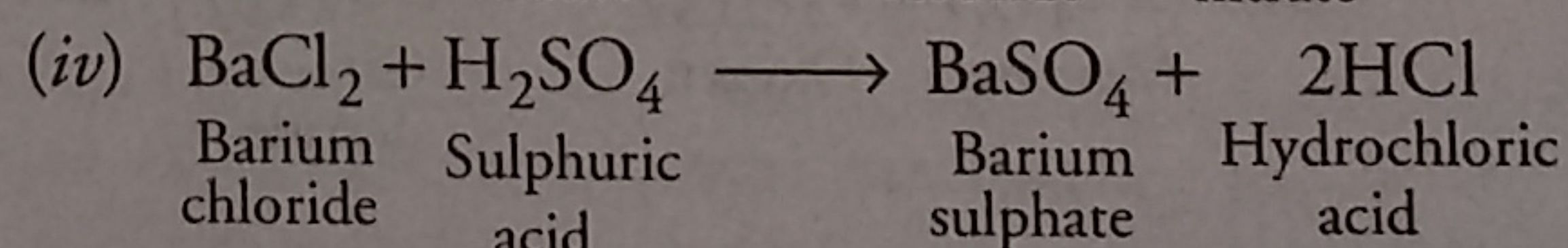
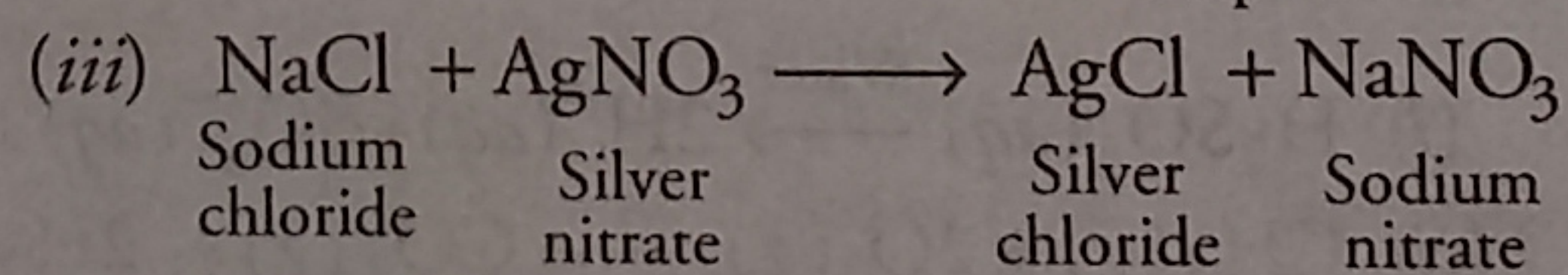
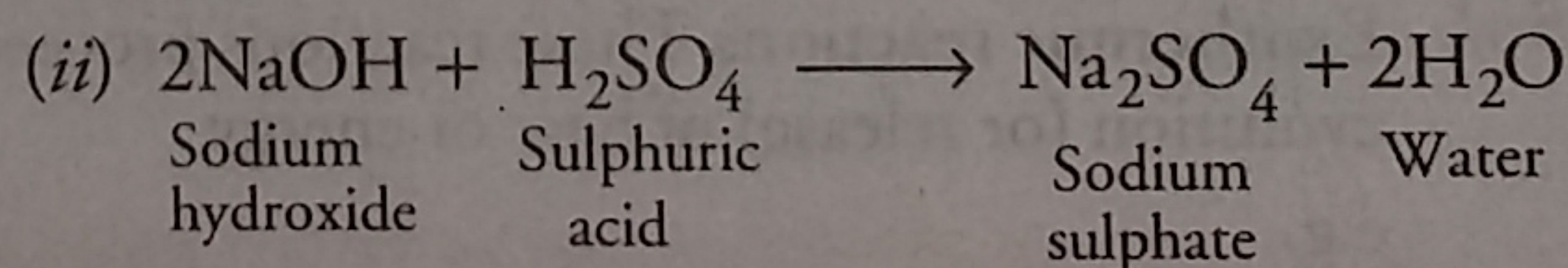
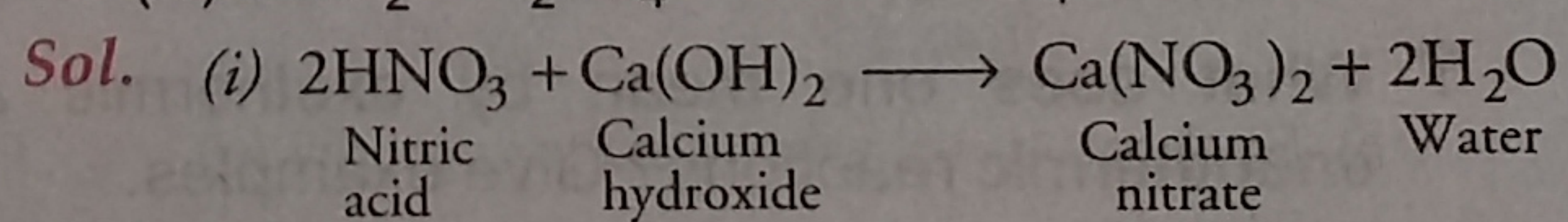
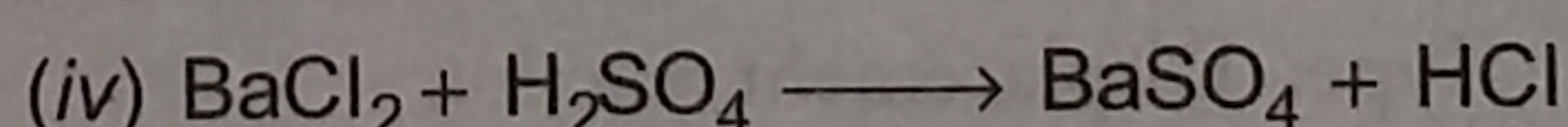
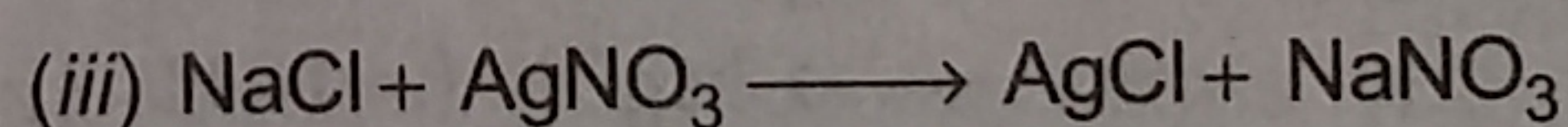
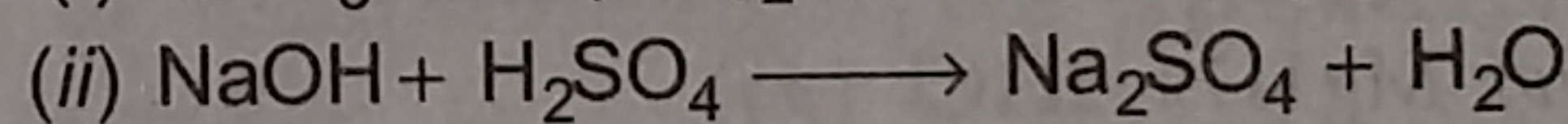
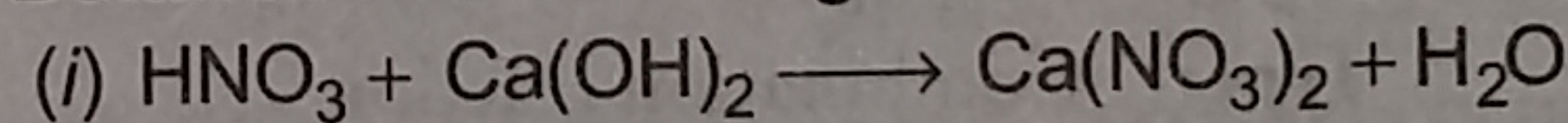
- (iii) it tells us about heat changes that can take place in a chemical reaction. Δ is the symbol of heat. Hence, it is endothermic or exothermic can be deduced from a balanced chemical equations.

5 Translate the following statements into chemical equations and then balance them:

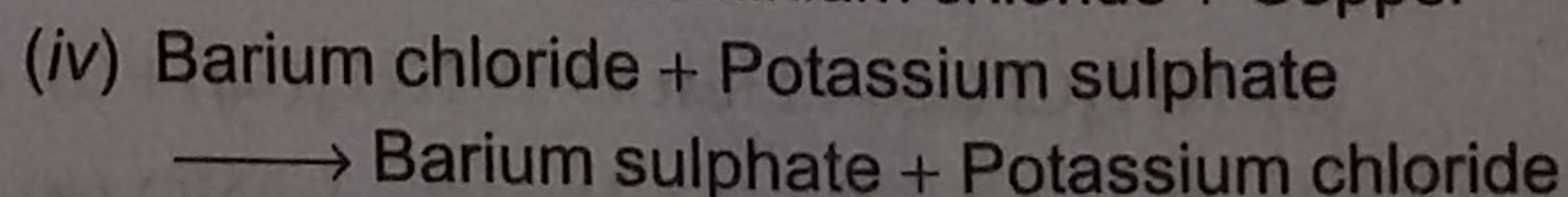
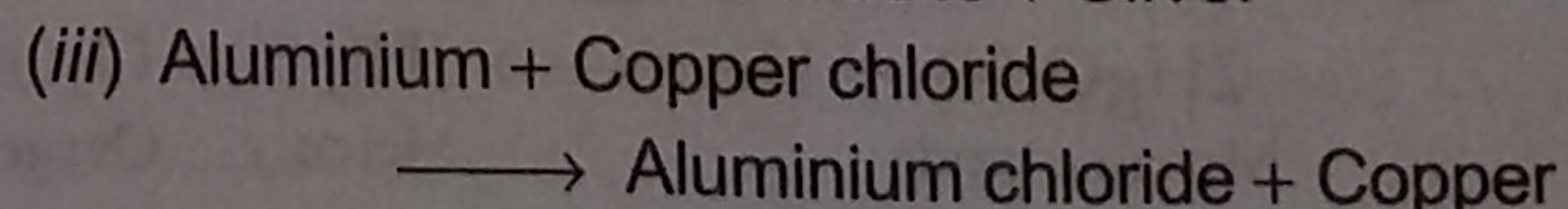
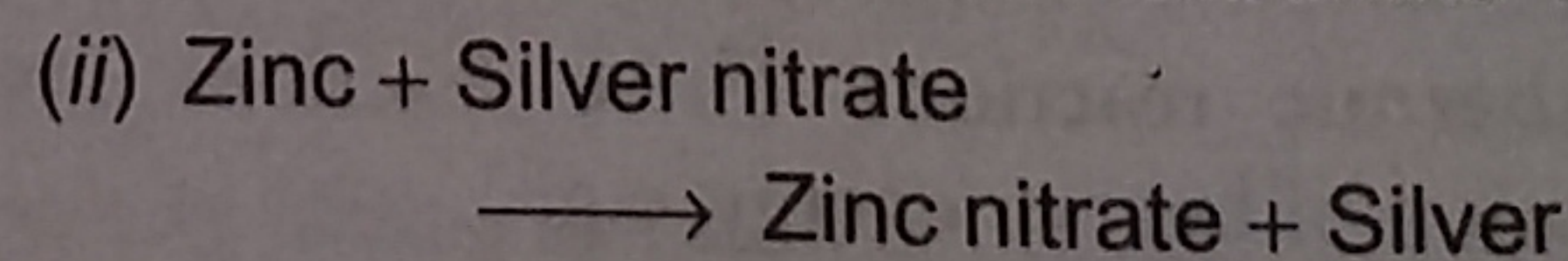
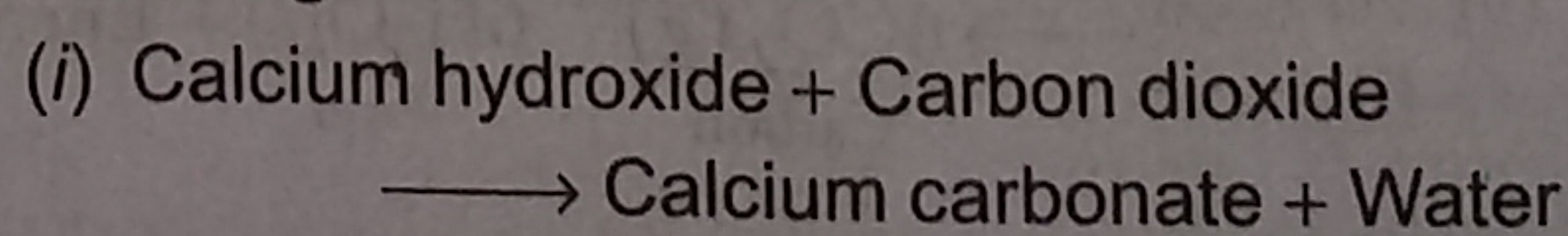
- (i) Hydrogen gas combines with nitrogen to form ammonia.
- (ii) Hydrogen sulphide gas burns in air to give water and sulphur dioxide.
- (iii) Barium chloride reacts with aluminium sulphate to give aluminium chloride and a precipitate of barium sulphate.
- (iv) Potassium metal reacts with water to give potassium hydroxide and hydrogen gas.



6 Balance the following chemical equations:

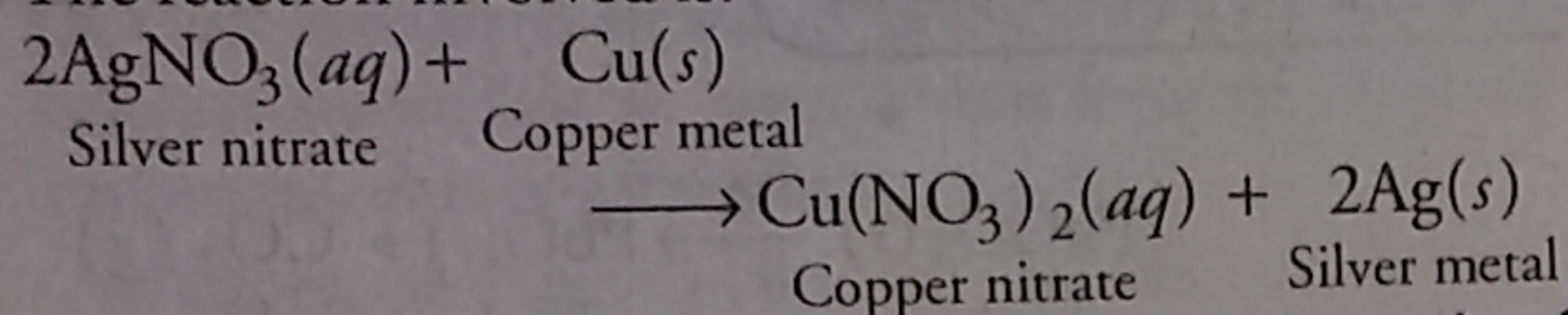


7 Write the balanced chemical equations for the following reactions:



- 14** In the refining of silver, the recovery of silver from silver nitrate solution involved displacement by copper metal. Write down the reaction involved.

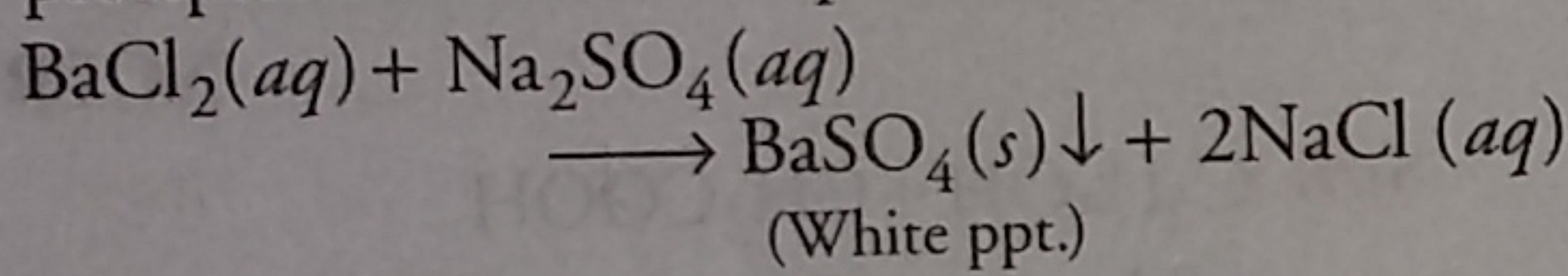
Sol. The reaction involved is:



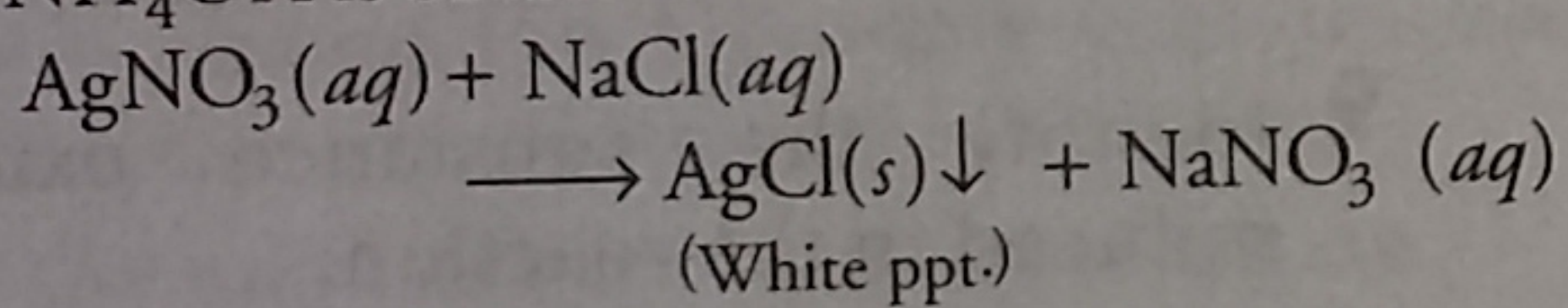
- 15** What do you mean by a precipitation reaction? Explain by giving examples.

Sol. The reaction which is accompanied by the formation of an insoluble solid mass (called precipitate) is known as precipitation reaction, e.g.

- (i) When barium chloride solution is added to an aqueous solution of sodium sulphate, a white precipitate of barium sulphate is obtained.



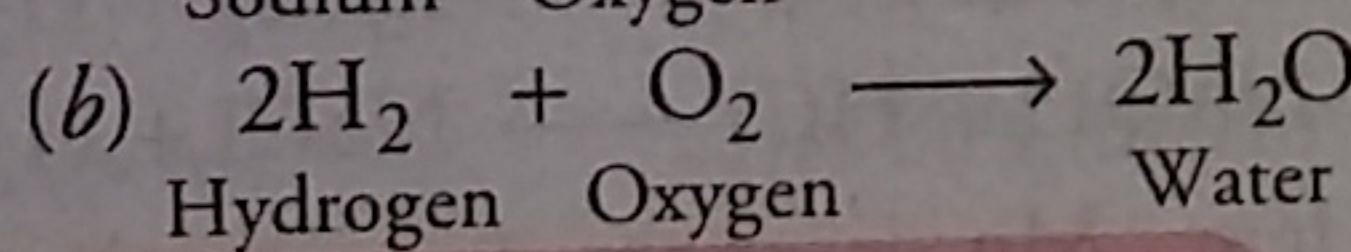
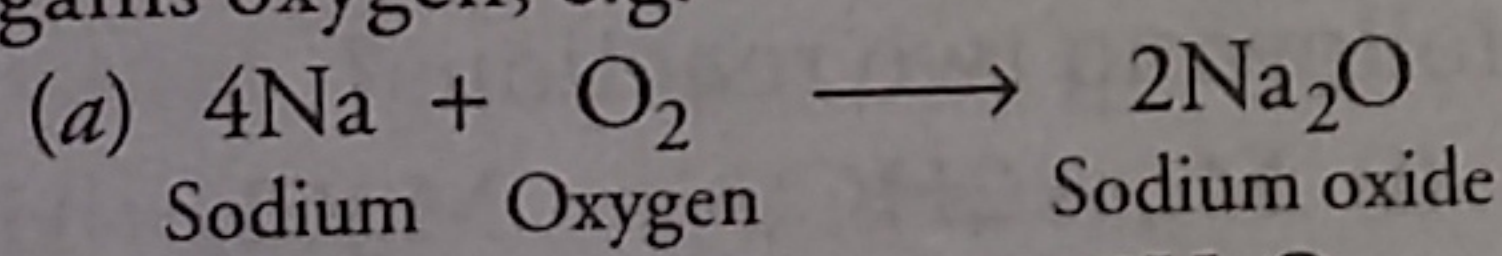
- (ii) When silver nitrate is added to an aqueous solution of sodium chloride, a white precipitate of silver chloride (AgCl), which is soluble in NH_4OH is obtained.



- 16** Explain the following in terms of gain or loss of oxygen with two examples each.

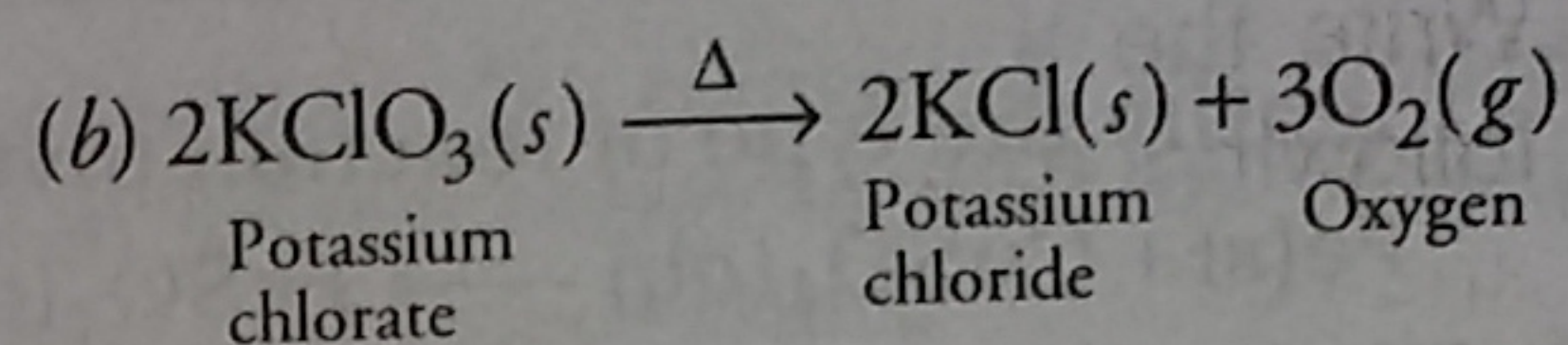
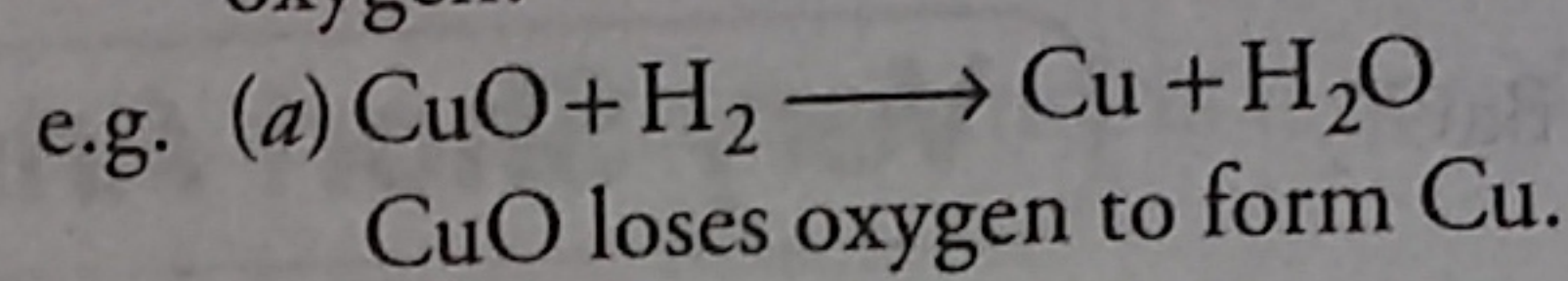
- (i) Oxidation (ii) Reduction

Sol. (i) **Oxidation** It is a process in which a substance gains oxygen, e.g.



In the above reactions, Na and H_2 gains oxygen to form Na_2O and H_2O respectively.

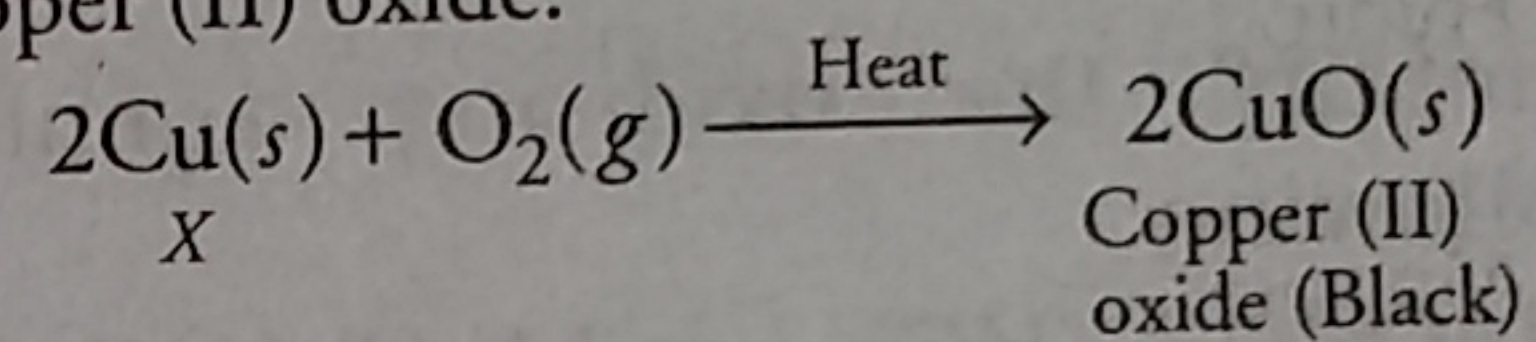
- (ii) **Reduction** It is a process in which a substance loses oxygen.



KClO_3 loses oxygen to form KCl and O_2 .

- 17** A shiny brown coloured element X on heating in air becomes black in colour. Name the element X and the black coloured compound formed.

Sol. Element X is copper and the black coloured compound is copper (II) oxide.



- 18** Why do we apply paint on iron articles?

Sol. By applying paint on iron articles, they can be prevented from corrosion (rusting). Paint does not allow oxygen (from air) and water (moisture) to come in contact with the surface of iron.

- 19** Oil and fat containing food items are flushed with nitrogen. Why? CBSE 2014

Sol. Nitrogen is unreactive gas as compared to oxygen. Oil and fat present in the food items get oxidised and become rancid in the presence of air or oxygen. But such reaction is prevented in the presence of nitrogen. Therefore, food items like potato chips etc., are packed with nitrogen gas to prevent them from rancidity for a long time.

- 20** Explain the following terms with one example of each:

- (i) Corrosion (ii) Rancidity

Sol. Refer to text on page 5 and 6.

SUMMARY

- A **chemical reaction** is a change in which one or more substance(s) (reactant(s)) react(s) to form new substance(s) (product(s)) with entirely different properties.
- The symbolic representation of a chemical reaction is chemical equation.
- A **balanced chemical equation** is that in which the total number of atoms of each element are equal on both sides of the equation.
- A reaction in which two or more reactants combine to form a single product is called **combination reaction**.
- A reaction in which a single reactant breaks down to form two or more products, is known as **decomposition reaction**.
- In **displacement reactions** a more active element displaces a less active element from its compound.
- In **double displacement reactions**, two different atoms or groups of atoms are exchanged.

- **Oxidation** is the process of addition of oxygen to a substance or removal of hydrogen from a substance.
- **Reduction** is the process of removal of oxygen from a substance or addition of hydrogen to a substance.
- Those reactions in which oxidation and reduction takes place simultaneously are called **redox reactions**.
- The reactions which are accompanied by the evolution of heat are called **exothermic reactions**. e.g. respiration.
- The reactions which occur by the absorption of heat/energy are called **endothermic reactions**. e.g. photosynthesis.
- **Corrosion** is the phenomenon due to which metals are slowly eaten away by the reaction of air, water and chemicals present in the atmosphere, is called corrosion. The corrosion of iron is called rusting.
- **Rancidity** is the process of slow oxidation of oils and fats present in the food materials resulting in the change of smell and taste in them.

For Mind Map

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