



## CHEMISTRY

### BOOKS - VK GLOBAL PUBLICATION CHEMISTRY (HINGLISH)

### CHEMICAL REACTIONS AND EQUATIONS

#### Ncert Intext Questions

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

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2. Write the balanced equation for the following chemical reactions.

(i) Hydrogen + Chlorine  $\rightarrow$  Hydrogen chloride

(ii) Barium chloride + Aluminium sulphate  $\rightarrow$  Barium sulphate + Aluminium chloride

(iii) Sodium + Water  $\rightarrow$  Sodium hydroxide + Hydrogen



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3. Write a balanced chemical equation with state symbols for the following reactions.

(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.

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

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

(ii) Write the reaction of the substance 'X' with water.

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5. Why is the amount of gas collected in one of the test tubes in Activity 1.7 double of the amount collected in the other? Name this gas.

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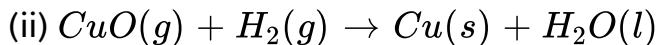
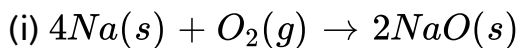
6. Why does the colour of copper sulphate solution change when an iron nail is dipped in it?

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7. Give an example of a double displacement reaction.

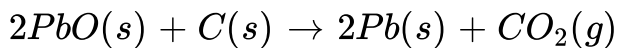
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8. Identify the substances that are oxidised and the substances that are reduced in the following reactions.



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



- (a) Lead is getting reduced.
- (b) Carbon dioxide is getting oxidised.
- (c) Carbon is getting oxidised.
- (d) Lead oxide is getting reduced.

A. (a) and (b)

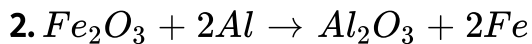
B. (a) and (c)

C. (a), (b) and (c)

D. all

**Answer:**





The above reaction is an example of a

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

**Answer: D**



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3. What happens when dilute hydrochloric acid is added to iron filings? Choose 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 and water are produced

**Answer: A**

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

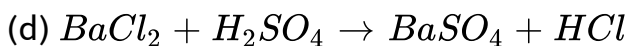
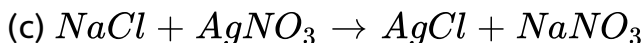
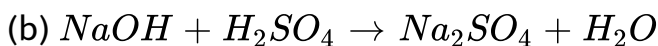
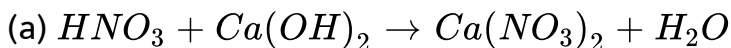
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5. Translate the following statements into chemical equations and then balance them:

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

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**6.** Balance the following chemical equations:



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7. Write the balanced chemical equations for the following reactions:

(a) Calcium hydroxide + Carbon dioxide  $\rightarrow$  Calcium carbonate + Water

(b) Zinc + Silver nitrate  $\rightarrow$  Zinc nitrate + Silver

(c) Aluminium + Copper chloride  $\rightarrow$  Aluminium chloride + Copper

(d) Barium chloride + Potassium sulphate  $\rightarrow$  Barium sulphate + Potassium chloride

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

(a) Potassium bromide(aq) + Barium iodide(aq)  $\rightarrow$  Potassium iodide(aq) + Barium bromide(s)

(b) Zinc carbonate(s)  $\rightarrow$  Zinc oxide(s) + Carbon dioxide(g)

(c) Magnesium(s) + Hydrochloric acid(aq)  $\rightarrow$  Magnesium chloride(aq) + Hydrogen(g)

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9. What does one mean by exothermic and endothermic reactions? Give examples

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10. Why is respiration considered an exothermic reaction? Explain.

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11. Why are decomposition reactions called the opposite of combination reactions? Write equations for these reactions.

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12. Write one equation each for decomposition reactions where energy is supplied in the form of heat, light or electricity.

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

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

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

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

(a) Oxidation

(b) Reduction

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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

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18. Why do we apply paint on iron articles?

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19. Oil and fat containing food items are flushed with nitrogen. Why?

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20. Explain the following terms with one example each:

(a) Corrosion (b) Rancidity

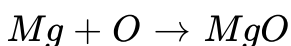
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### Very Short Answer Questions

1. Why is combustion of Liquefied Petroleum Gas (LPG) a chemical change?

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2. What is wrong with the following equation?



Identify the mistake and balance the equation.

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3. Potassium chlorate ( $KClO_3$ ) on heating forms potassium chloride and oxygen. Write a balanced equation for this reaction.

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4. 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. Identify the brown gas 'X'.

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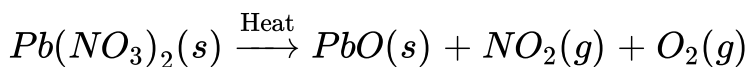
5. Convey the following information in the form of a balanced chemical equation:

"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."

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6. Balance the following chemical equation:



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7. Give one example of a combination reaction which is also exothermic.

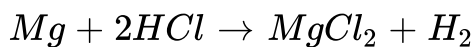
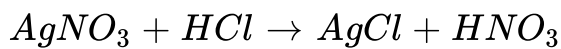
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8. Why will the colour of heated copper powder become black when air is passed over it?

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9. What is the difference between the following two types of reactions?

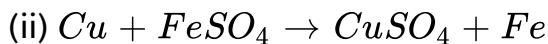
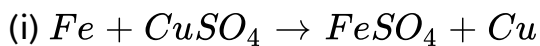


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10. Why is hydrogen peroxide kept in coloured bottles?

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**11.** Consider the following reactions:



Which of these two reactions will take place and why?

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**12.** Give one example of a reaction which is a double displacement reaction as well as a precipitation reaction.

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**13.** Why is photosynthesis considered an endothermic reaction ?

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**14.** What type of reaction is represented by the digestion of food in our body?

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**15.** How will you test for the gas which is liberated when hydrochloric acid reacts with an active metal?

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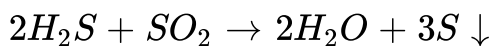
**16.** Can a double displacement reaction take place when the products are highly soluble or highly ionised?

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17. What changes in the colour of iron nails and copper sulphate solution do you observe after keeping the iron nails dipped in copper sulphate solution for about 30 minutes?

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18. Name the oxidising and reducing agent in the following reaction:



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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?



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20. Define rancidity.



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21. Name one synthetic antioxidant.



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## Short Answer Questions I

1. Which among the following are physical or chemical changes?

(a) Evaporation of petrol

(b) Burning of Liquefied Petroleum Gas (LPG)

(c) Heating of an iron rod to red hot

(d) Curdling of milk

(e) Sublimation of solid ammonium chloride

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2. How do we come to know that a chemical reaction has taken place?

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3. What is an oxidation reaction? Given an example of oxidation reaction. Is oxidation an exothermic or an endothermic reaction?

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4. Why do fire flies glow at night?

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5. Given reason:

(a) Aluminium is a reactive metal but is still used for packing food articles.

(b) Red litmus paper turns blue when touched with aqueous solution of magnesium oxide.

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6. What happens when silver chloride is exposed to sunlight ?

Write a chemical equation for this reaction. Also give one use of such a reaction .

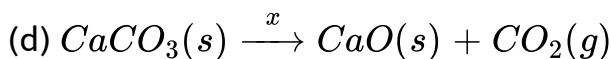
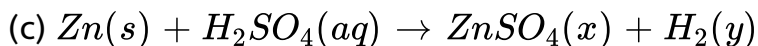
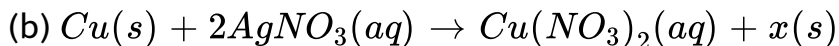
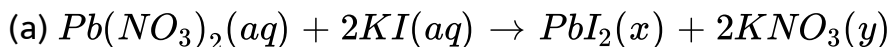
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7. What type of chemical reactions are represented by the following equations?



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



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9. Zinc liberates hydrogen gas when reacted with dilute hydrochloric acid, whereas copper does not. Explain, why?

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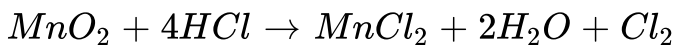
10. On adding dilute HCl to copper oxide powder, the solution formed is blue-green. Predict the new compound formed which imparts a blue-green colour to the solution.

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11. Ferrous sulphate decomposes with the evolution of a gas having a characteristic odour of burning sulphur. Write the chemical reaction involved and identify the type of reaction.

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12. Identify the substances oxidised, substance reduced, oxidising agent and reducing agent:



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13. Grapes hanging on the plant do not ferment but after being plucked from the plant can be fermented. Under what conditions do these grapes ferment? Is it a chemical or a physical change?

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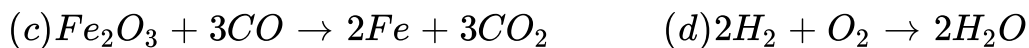
14. A copper coin is kept immersed in a solution of silver nitrate for some time. What will happen to the coin and the colour of the solution?

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15. Identify the reducing agent in the following reactions.

(a)



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16. What is the role of a catalyst in a chemical reaction?

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Short Answer Questions li

1. Translate the following statements into chemical equations and balance them:

(i) Lead nitrate reacts with sulphuric acid to form a precipitate of lead sulphate and nitric acid.

(ii) Magnesium burns in the presence of nitrogen to form magnesium nitride.

(iii) Aluminium metal strip is added in hydrochloric acid to produce aluminium chloride and hydrogen gas.



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2. 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

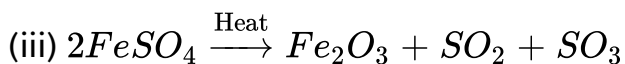
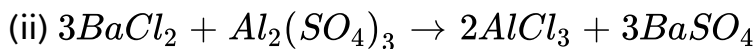
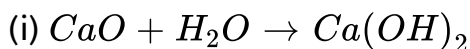
sodium acetate and water.

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

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

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



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4. Translate the following statement into chemical equations and then balance the equations:

(i) Phosphorus burns in oxygen to give phosphorus pentoxide.

(ii) Aluminium metal replaces iron from ferric oxide,  $Fe_2O_3$ , giving aluminium oxide and iron.

(iii) Carbon disulphide burns in air to give carbon dioxide and sulphur dioxide.

(iv) Barium chloride reacts with zinc sulphate to give chloride and barium sulphate.

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5. (i) What is observed when a solution of potassium iodide is added to a solution of lead nitrate taken in a test tube?

(ii) What type of reaction is this?

(iii) Write a balanced chemical equation to represent the above reaction.

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6. What happens when silver nitrate solution is added to sodium chloride solution ?

(a) Write the equation for the reaction which takes place.

(b) Name the type of reaction involved.

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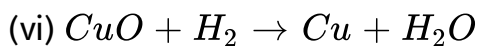
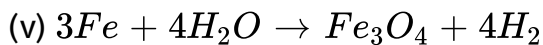
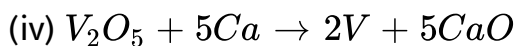
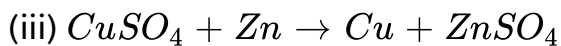
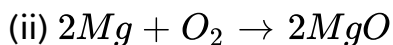
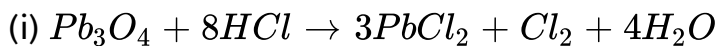
7. (a) What is the colour of ferrous sulphate crystals ? How does this colour change after heating?

(b) Name the product formed on strongly heating ferrous sulphate crystals. What type of chemical reaction occurs in this change?



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8. Identify the oxidising agent (oxidant) in the following reactions.



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9. Solid calcium oxide was taken in a container and water was added slowly to it



(i) State two observations made in the experiment.

(ii) write the name of the chemical formula of thw product.

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**10.** A magnesium ribbon is burnt in oxygen to give a white compound X accompanied by emission of light. If the burning ribbon is now placed in an atmosphere of nitrogen, it continues to burn and forms a compound Y.

(a) Write the chemical formulae of X and Y.

(b) Write a balanced chemical equation, when X is dissolved in water.

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**11.** Identify the type of chemical reaction taking place

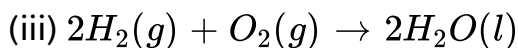
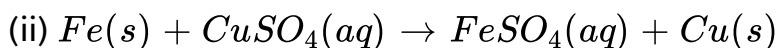
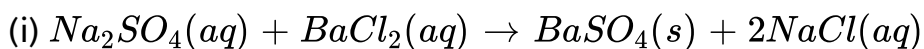
(i) on mixing a solution of potassium chloride with silver nitrate,

an insoluble white substance is formed.

(ii) on heating green coloured ferrous sulphate crystals, reddish-brown solid is left and smell of a gas having odour of burning sulphur is observed.

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**12.** Identify the type of reaction in the following examples :



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**13.** During the reaction of some metals with dilute hydrochloric acid, following observations were made.

(a) Silver metal does not show any change

(b) The temperature of the reaction mixture rises when aluminium (Al) is added

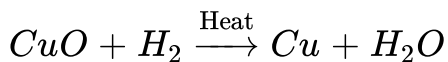
(c) The reaction of sodium metal is found to be highly explosive

(d) Some bubbles of a gas are seen when lead (Pb) is reacted with the acid Explain these observations giving suitable reasons.

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## Long Answer Questions

1. Consider the chemical equation given below and answer the questions that follow:



(i) Name the substance which is getting oxidised.

(ii) Name the substance which is getting reduced.

(iii) Name the oxidising agent.

(iv) Name the reducing agent.

(v) What type of a reaction does this equation represent?

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2. Give the characteristic tests for the following gases:

(i)  $CO_2$  (ii)  $SO_2$  (iii)  $O_2$  (iv)  $H_2$

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3. With the help of an activity explain that hydrogen and oxygen are released when an electric current is passed through water.

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4. What happens when zinc granules are treated with dilute solution of  $H_2SO_4$ ,  $HCl$ ,  $HNO_3$ ,  $NaCl$  and  $NaOH$  ? Also write the chemical equations if reaction occurs.

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5. (i) Crystals of copper sulphate are heated in a test tube for some time.

(a) What is the colour of copper sulphate crystals before heating, and after heating?

(b) What is the source of liquid droplets seen on the inner upper side of the test tube during the heating process?

(ii) A metal 'X' when dipped in aqueous solution of aluminium sulphate no reaction is observed whereas when it is dipped in an aqueous solution of ferrous sulphate, the pale green solution turns colourless. Identify metal 'X' with reason.

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## Hots

1. Samuel had a silver coin which turned black. He kept the coin in a bowl lined with aluminium foil. Then he filled the bowl with water and boiled it. After sometime, he found that the coin has become new. Its blackness disappeared. How did it happen?

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2. A few drops of sulphuric acid are added to water before electrolysis. Why?

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3. Justify with the help of an example that displacement reaction is also a redox reaction.

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4. Compound 'A' when dissolved in water gives compound 'B' which is used in whitewashing.

Compound 'B' reacts with  $CO_2$  to form a white precipitate of compound 'C'. Identify compounds 'A', 'B' and 'C'. Also write the equations involved.

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5. When  $CaO$  is added to water taken in a beaker, rise in temperature is observed. However, when  $Ba(OH)_2$  is mixed with  $NH_4Cl$ , a fall in temperature is observed. Why?

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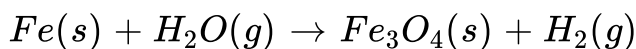
6. A brown substance 'X' on heating in air forms a substance 'Y'. When hydrogen gas is passed over heated 'Y', it again changes back into 'X'.

- (i) Name the substances X and Y.
- (ii) Name the chemical processes occurring during both the changes.
- (iii) Write the chemical equations.

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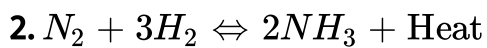
## Proficiency Exercise Very Short Answer Questions

1. Balance the following chemical equation:





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What can be concluded from the above reaction?

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3. Why do iron articles lose their shine gradually?

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4. State one industrial application of reduction.

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5. A blue coloured salt of copper sulphate becomes white on heating. Give reason.

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6. What type of chemical reaction takes place when silver bromide is exposed to sunlight?

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### Proficiency Exercise Short Answer Questions I

1. Classify the following chemical reactions as exothermic or endothermic:

(a) Electrolysis of water (b) Burning of natural gas

(c ) Decomposition of calcium carbonate (d) Burning of magnesium ribbon in air

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2. What change will you observe if white silver chloride is placed in sunlight? Write an equation for the reaction and the type of the reaction.

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3. What happens chemically when quick lime is added to water ?

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4. A solution of potassium chloride when mixed with silver nitrate solution, an insoluble white substance is formed. Write the chemical reaction involved and also mention the type of the chemical reaction.

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### Proficiency Exercise Short Answer Questions I

1. When a green iron salt is heated strongly, its colour finally changes to brown and odour of burning sulphur is given out.

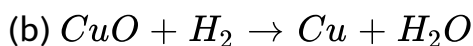
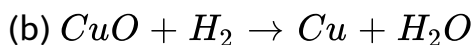
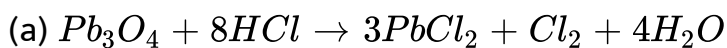
(a) Name the iron salt.

(b) Name the type of reaction that takes place during the heating of iron salt.

(c) Write a chemical equation for the reaction involved.

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2. What is redox reaction? Identify the substance oxidised and the substance reduced in the following reactions.



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3. Identify the type of each of the following reactions:

(a) A reaction in which a single product is formed from two or more reactants.

(b) The reaction mixture becomes warm.

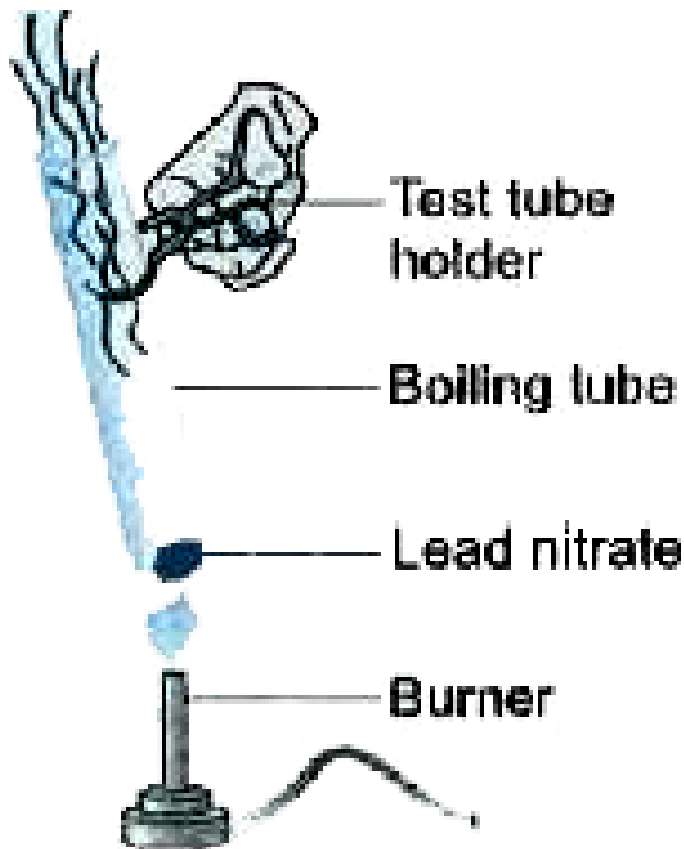
(c) An insoluble substance is formed.

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1. Observe the diagram given alongside and answer the following questions:

- (a) What do you observe when lead nitrate is heated?
- (b) Mention the two gases evolved during heating.
- (c) Write the balanced chemical equation for it.
- (d) What is the type of chemical reaction called?

(e) Give one more example of this type of reaction.



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2. Write balanced chemical equations for the following word equations:

(a) Calcium hydroxide + Carbon dioxide  $\rightarrow$  Calcium carbonate +

Water

(b) Phosphorus pentachloride + Water  $\rightarrow$  Phosphoric acid +  
Hydrogen chloride

(c) Zinc + Silver nitrate  $\rightarrow$  Zinc nitrate + Silver

(d) Sodium + Water  $\rightarrow$  Sodium hydroxide + Hydrogen

(e) Aluminium + Copper chloride  $\rightarrow$  Aluminium chloride +  
Copper



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