CHEMISTRY

BOOKS - NAND LAL PUBLICATION

CHEMICAL REACTIONS AND EQUATIONS

Activity 1 1

1. CAUTION: This activity needs the teacher's assistance. It would be better if students wear

suitable eyeglasses.

• Clean a magnesium ribbon, about 3-4 cm Tong by rubbing it with sand paper.

Hold it with a pair of tongs. Burn it using a spirit lamp or a burner and collect the ash so formed in a watch glass as shown in Fig. Burn the magnesium ribbon keeping it away as far as possible from your eyes.

What do you observe ?

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Activity 1 2

1. • Take lead nitrate solution in a test tube.

• Add potassium iodide solution to this.

What do you observe ?

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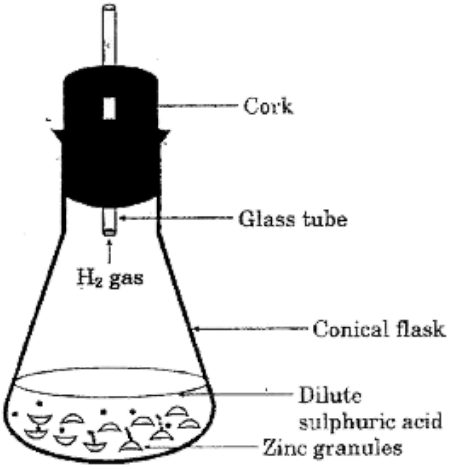
Activity 1 3

1. • Take a few zinc granules in a conical flask or a test tube.

• Add dilute hydrochloric acid or sulphuric acid to fig.



Formation of hydrogen gas by the action of dilute sulphuric acid on zinc

CAUTION : Handle the acid with care.

Do you observe anything happening around of zinc granules ?

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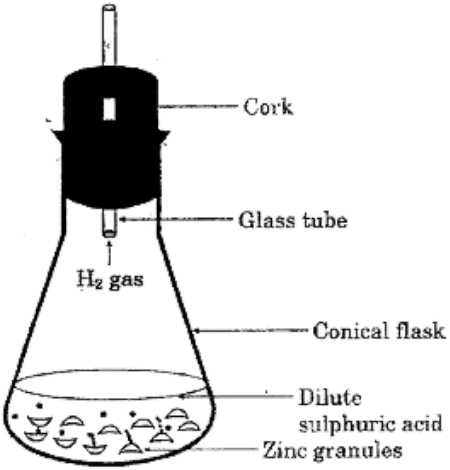
2. • Take a few zinc granules in a conical flask or a test tube.

• Add dilute hydrochloric acid or sulphuric acid to fig.



Formation of hydrogen gas by the action of dilute sulphuric acid on zinc

CAUTION : Handle the acid with care.

Touch the conical flask or test tube. Is there change in its temperature ?

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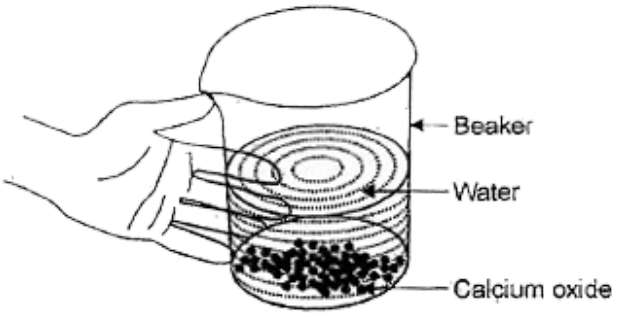
Activity 1 4

1. • Take a small amount of calcium oxide or quick lime in beaker.

• Slowly add water to this.



Formation of slaked lime by the reaction of calcium oxide with water

• Touch the beaker as shown in Fig.

Do you feel any change in temperature?

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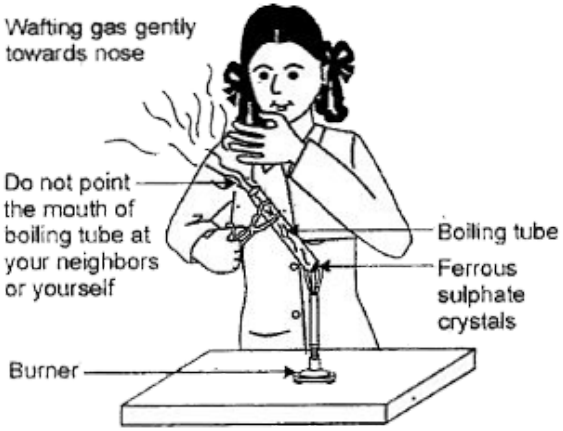
Activity 1 5

1. •Take about 2 g ferrous sulphate crystals in a dry bottle tube.

• Note the colour of the ferrous sulphate crystals.

• Heat the boiling tube over the flame of a

burner or spirit lamp as shown in Fig.



Correct way of heating the test tube containing crystals of ferrous sulphate and of smelling the odour

Observe the colour of the crystals after heating.

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Activity 1 6

1. • Take about 2 g lead nitrate powder in a boiling tube.

• Hold the boiling tube with a pair of tongs and heat it over a flame,

What do you observe ? Note down the change, if any.

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Activity 1 7

1. • Take a plastic mug. Drill two holes at its base and fill rubber stoppers in these holes. Insert carbon electrode in these rubber stoppers as shown in Fig.

• Connect these electrodes to a 6 volt battery.

• Fill the mug with water such that the electrodes are immersed. Add a few drops of dilute sulphuric acid to the water.

•Take two test tubes filled with water and invert there over the two carbon electrodes. Switch on the current and leave the apparatus undisturbed for some time.

• You will observe the formation of bubbles at both the electrodes. These bubbles displace water in the test tubes.

Is the volume of the gas collected the same in both the test tubes ?

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2. • Take a plastic mug. Drill two holes at its base and fill rubber stoppers in these holes. Insert carbon electrode in these rubber stoppers as shown in Fig.

• Connect these electrodes to a 6 volt battery.

• Fill the mug with water such that the electrodes are immersed. Add a few drops of dilute sulphuric acid to the water.

•Take two test tubes filled with water and invert there over the two carbon electrodes. Switch on the current and leave the apparatus undisturbed for some time.

• You will observe the formation of bubbles at both the electrodes. These bubbles displace water in the test tubes.

What happens in each case ?

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3. • Take a plastic mug. Drill two holes at its base and fill rubber stoppers in these holes. Insert carbon electrode in these rubber stoppers as shown in Fig.

• Connect these electrodes to a 6 volt battery.

• Fill the mug with water such that the electrodes are immersed. Add a few drops of dilute sulphuric acid to the water.

•Take two test tubes filled with water and invert there over the two carbon electrodes. Switch on the current and leave the apparatus

undisturbed for some time.

• You will observe the formation of bubbles at both the electrodes. These bubbles displace water in the test tubes.

Which gas is present in each test tube ?

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Activity 1 8

1. • Take about 2 g silver chloride in a china dish.

What is its colour?

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2. What is formed of grey colour from silver chloride in sun light?

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Activity 1 9

1. • Take three iron nails and clean them by rubbing with sand paper.

• Take two test tubes marked as (A) and (B). In each test | tube, take about 10 ml copper sulphate solution.

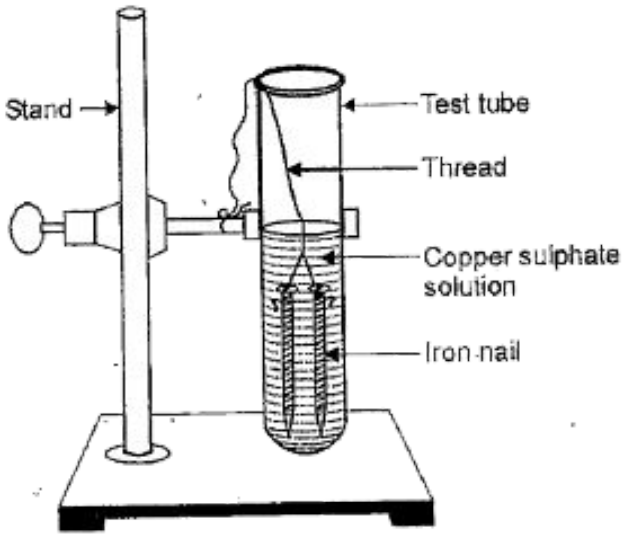
• Tie two iron nails with a thread and immerse them 'carefully in the copper sulphate solution in test tube B for about 20 minutes [Fig. (a)]. Keep one iron nail aside for comparison.

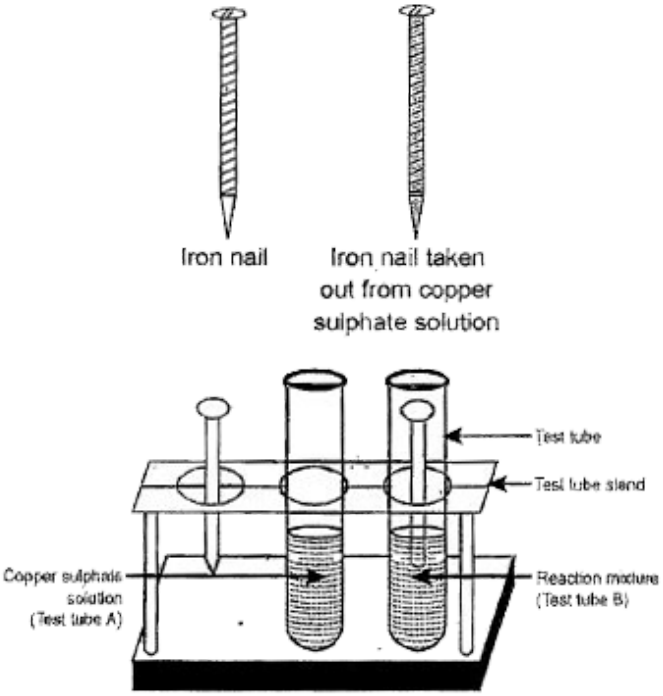
• After 20 minutes, take out the iron nails from the copper sulphate solution.

• Compare the intensity of the blue colour of

copper sulphate solutions in test tubes (A) and (B) (Fig. (b)].

Also, compare the colour of the iron nails dipped in the copper sulphate solution with the one kept aside [Fig. - (b)].





On the basis of activity , give the answers of th following questions :

What is the colour of copper sulphat solution in test tube A ?

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2. • Take three iron nails and clean them by rubbing with sand paper.

• Take two test tubes marked as (A) and (B). In each test | tube, take about 10 ml copper sulphate solution.

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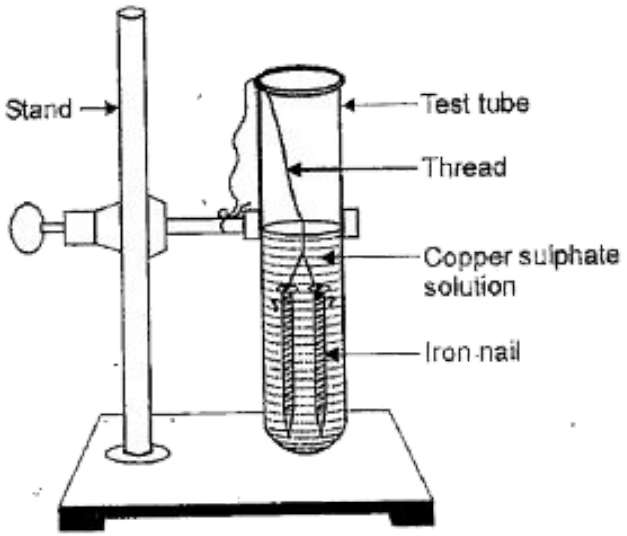

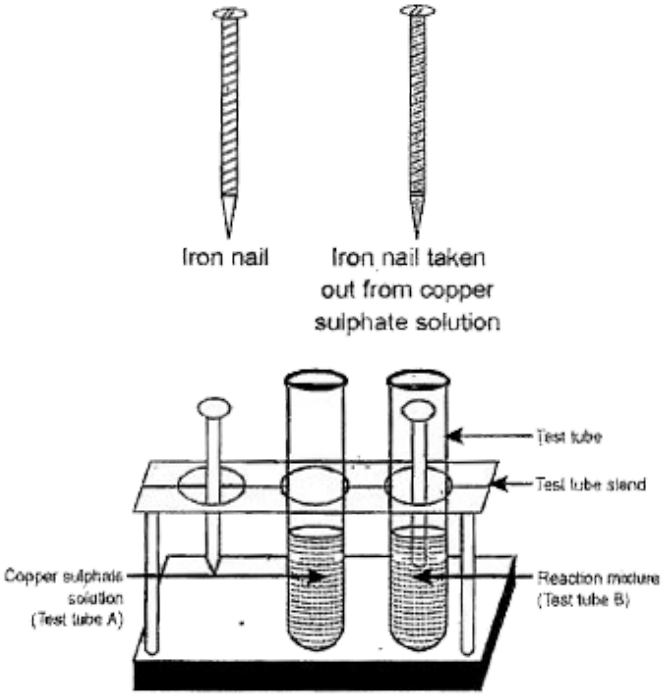

On the basis of activity , give the answers of th following questions :

What is the colour of copper sulphat solution in test tube A ?

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3. • Take three iron nails and clean them by rubbing with sand paper.

• Take two test tubes marked as (A) and (B). In each test | tube, take about 10 ml copper sulphate solution.

• Tie two iron nails with a thread and immerse them 'carefully in the copper sulphate solution in test tube B for about 20 minutes [Fig. (a)]. Keep one iron nail aside for comparison.

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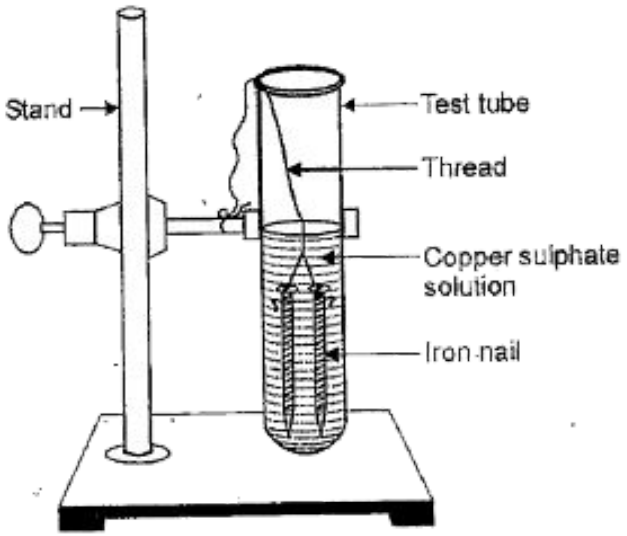

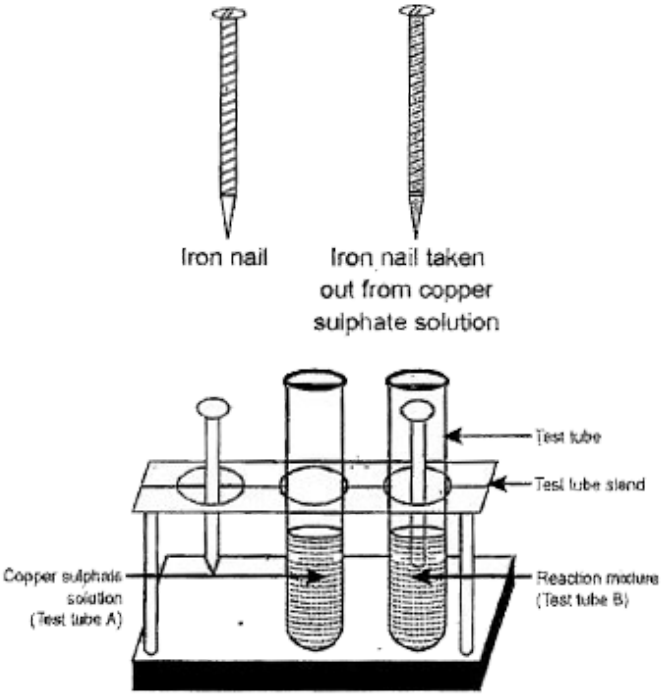

On the basis of activity , give the answers of th following questions :

What is the colour of copper sulphat solution in test tube A ?

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4. • Take three iron nails and clean them by rubbing with sand paper.

• Take two test tubes marked as (A) and (B). In each test | tube, take about 10 ml copper sulphate solution.

• Tie two iron nails with a thread and immerse them 'carefully in the copper sulphate solution in test tube B for about 20 minutes [Fig. (a)]. Keep one iron nail aside for comparison.

• After 20 minutes, take out the iron nails from the copper sulphate solution.

• Compare the intensity of the blue colour of

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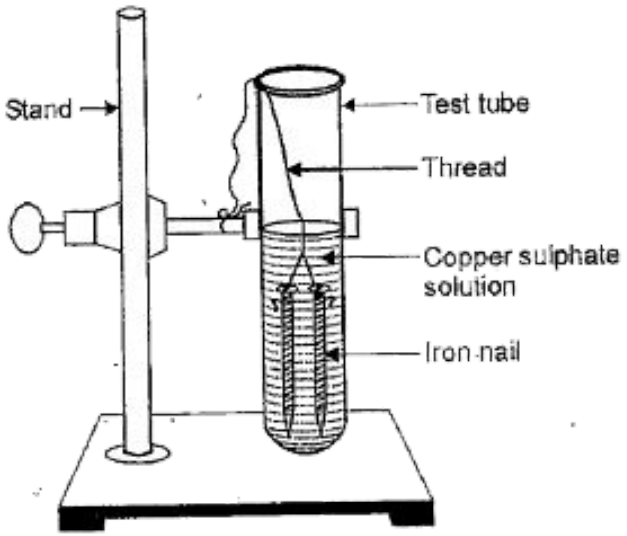
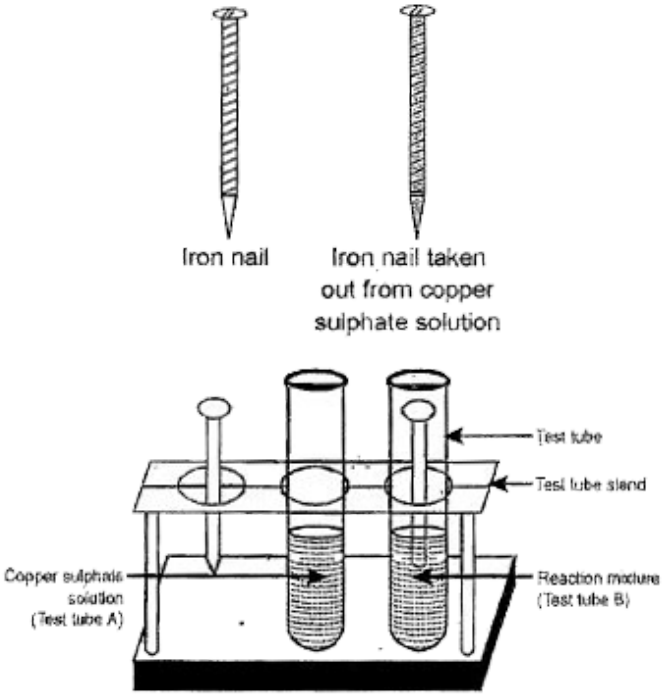
Also, compare the colour of the iron nails dipped in the copper sulphate solution with the one kept aside [Fig. - (b)].





On the basis of activity , give the answers of th following questions :

What is the colour of copper sulphat solution in test tube A ?

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5. • Take three iron nails and clean them by rubbing with sand paper.

• Take two test tubes marked as (A) and (B). In each test | tube, take about 10 ml copper sulphate solution.

• Tie two iron nails with a thread and immerse them 'carefully in the copper sulphate solution in test tube B for about 20 minutes [Fig. (a)]. Keep one iron nail aside for comparison.

• After 20 minutes, take out the iron nails from the copper sulphate solution.

• Compare the intensity of the blue colour of

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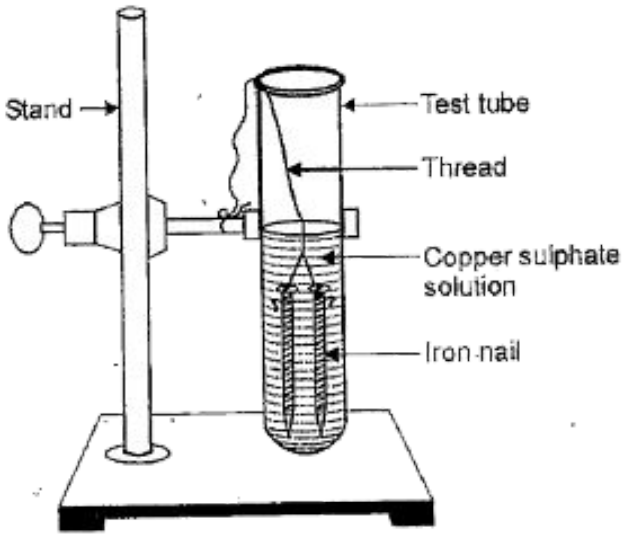
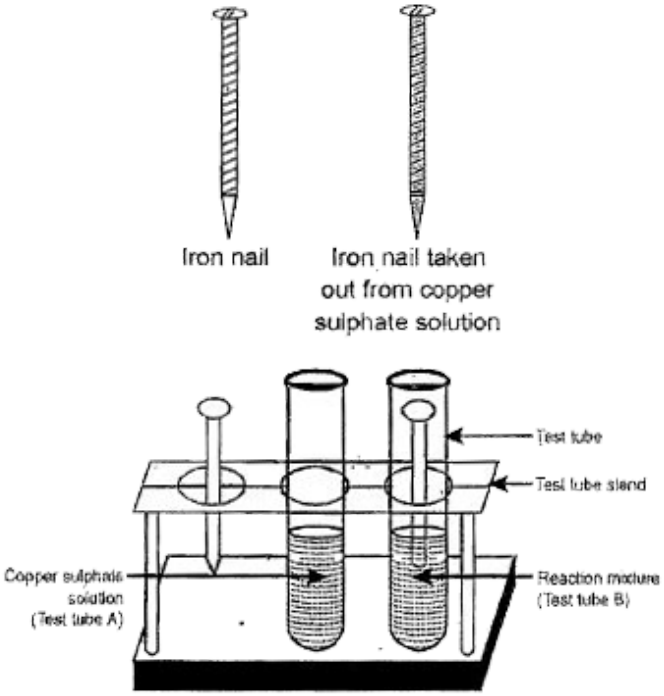
Also, compare the colour of the iron nails dipped in the copper sulphate solution with the one kept aside [Fig. - (b)].





On the basis of activity , give the answers of th following questions :

What is the colour of copper sulphat solution in test tube A ?

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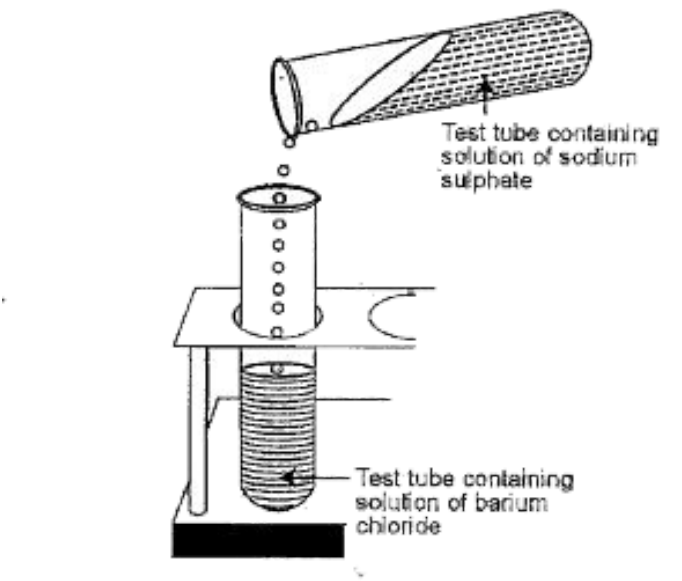
Activity 1 10

1. • Take about 3 ml of sodium sulphate solution in a test tube.

In another test tube, take about.3 ml of barium chloride solution.

Mix the two solutions (Fig.).



What do you observe ?

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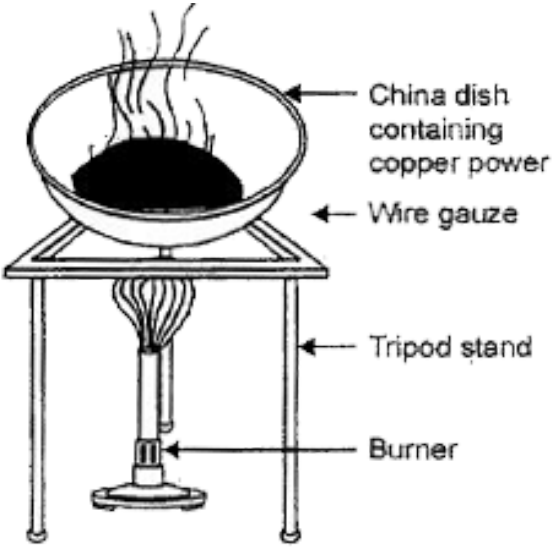
Activity 1 11

1. • Heat a china dish containing about 1g copper power (Fig.).



Oxidation of copper to copper oxide

What do you observe ?

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Intext Questions

1. With what, magnesium ribbon is cleaned before buning it in air.

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2. Write the balanced chemical equation for the following reaction and identify the type of reaction. Hydogen (g)+Chlorine(g) $\rightarrow$ Hydrogen chloride(g)

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3. Write the balanced equation for the following chemical reactions :

Barium chloride + Sodium sulphate $\rightarrow$ Barium sulphate + Sodium chloride

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4. Write the balanced equation for the following chemical reactions :

Nitrogen + Hydrogen $\rightarrow$ Ammonia

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5. Write a balanced chemical equation with state symbols for the reaction : solution of barium chloride and sodium sulphate in water react to give insoluble barium sulphate and the solution of sodium chloride.

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

Solution of barium chloride and sodium sulphate water react to give insoluble barium sulphate and the . solution of sodium chloride.

Sodium hydroxide solution (in water) reaction with hydrochloric acid solution (in water) to product sodium chloride solution and water.

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7. A solution of substance 'X' is used for white washing. Name the substance 'X' and write its formula

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8. A solution of substance 'X' is used for white washing. Write the reaction of the substance X named in above with water.

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9. Why is the amount of gas collected in one of the test tubes in activity1.7 double of the amount collected in the other?name this gas.

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10. Why does the colour of copper sulphate solution change,when anb iron nail is dipped in it?

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11. Give an example of a double displacement reaction other than the one give in the activity1.10 given in textbook

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

$4Na(s) + O_2(g) \rightarrow 2Na_2O(s)$

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13. Identify the substances that are oxidised and the substance that are reduced in the following reaction:

$CuO(s) + H2(g) \rightarrow Cu(s) + H2O(I)$

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Exercises

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

$2PbO_s + C(s) \rightarrow 2Pb(s) + CO_2(g)$

(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: A::B::D

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2. $Fe_2O_3 + 2Al \rightarrow Al_2O_3 + 2Fe$

The above réaction 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? 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.

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 statement into chemical equation and then balance that.

Hydrogen gas combines with nitrogen to form ammonia.

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6. Translate the following statements into chemical equation and balance the equations : hydrogen sulphide gas burns in air to give water and sulphur dioxide.

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

Barium chloride reacts with aluminium sulphate to give aluminium chloride and precipitate of barium sulphate.

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

Potassium metal reacts with water to give potassium hydroxide and hydrogen gas.

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9. Balance the chemical equation : $HNO_3 + Ca(OH)_2 \rightarrow Ca(NO_3)_2 + H_2O$

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10. Balance the following chemical equation:

$NaOH + H2SO4 \rightarrow Na2SO4 + H2O$

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11. Balance the following chemical equation:

$NaCl + AgNO3 \rightarrow AgCl + NaNO3$

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12. Balance the following chemical equation:

$BaCl2 + H2SO4 \rightarrow BaSO4 + HCl$

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13. Write the balanced chemical equation for the following reaction.

Calcium hydroxide + Carbon dioxide $\rightarrow$ Calcium carbonate + Water

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14. Write the balanced chemical equation for the following reaction: Zinc+Silver nitrate $\rightarrow$ Zinc nitrate + Silver

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15. Write the balanced chemical equation for the following reaction: Aluminium + Copper chloride $\rightarrow$ Aluminium chloride + copper

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16. Write the balanced chemical equation for the following reaction: Barium chloride + Potassium sulphate $\rightarrow$ Barium sulphate + Potassium chloride.

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17. Write the balanced chemical equation for the following reaction and identify the type of reaction

Potassium bromide (aq) +Barium iodide (aq)

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

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18. Write the balanced chemical equation for the following reaction and identify the type of reaction . Zinc carbonate (s) $\rightarrow$ Zinc oxide (s)+Carbon dioxide

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19. Write the balanced chemical equation for the following reaction and identify the type of reaction. Hydogen (g)+Chlorine(g) $\rightarrow$ Hydrogen chloride(g)

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20. Write the balanced chemical equation for the following reaction and identify the type of reaction . Magnesium (s)+Hydrochloric

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

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

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22. Why is respiration considered as an exothermic reaction?explain

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23. Why are decompositon reactions called opposite of combination reactions?write equations for these reactions

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

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25. What is the difference between the displacement and double displacement reaction write equation for these reations

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26. 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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27. What do you mean by precipitation reaction?explain by giving examples

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28. Explain the following in terms of gain or loss of oxygen with two examples each: oxidation and reduction

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

Reduction

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30. A shiny brown coloured element x on heating in air becomes black in colour name the element x and the blacked coloured compound formed

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31. Why do we apply paint on iron articles?

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32. Oil and fat containing food items are flushed with nitrogen why?

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33. Explain the following term with one example : Corrosion

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34. Explain the following term with one example : Rancidity.

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Additional Questions

1. What does the symbol (aq) represent in a chemical equation ?

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2. What are reactants?

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3. What is a chemical equation ? Illustrate with example.

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4. What are double displacement reaction. Explain with example.

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5. What are the drawbacks of a chemical equation ? Illustrate with an example.

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