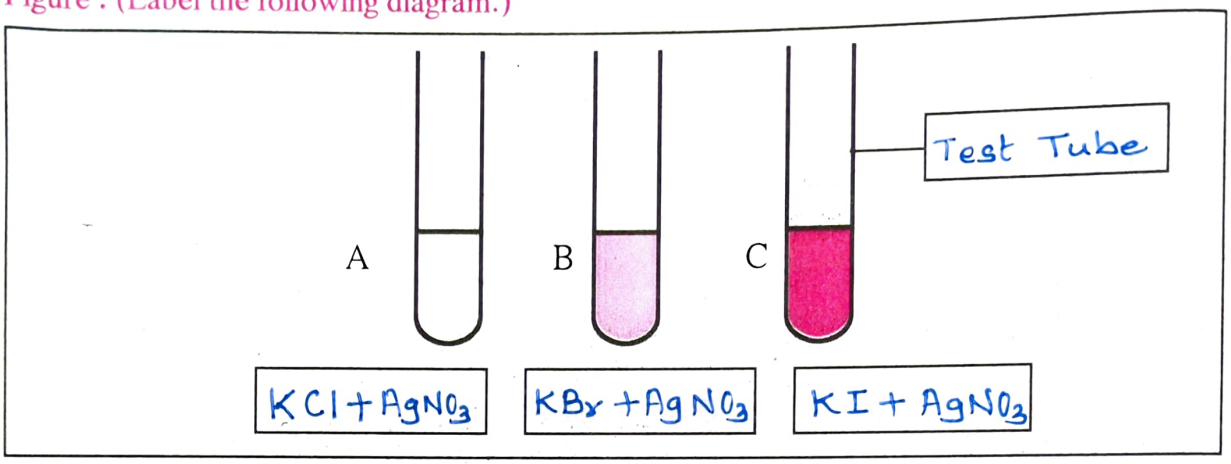
Practical No.1

Aim : To identify the chloride, bromide and iodide ions from the given salts.

Apparatus : Test Tubes, Stand etc.

Chemicals : Silver nitrate, solutions of potassium chloride, potassium bromide and potassium iodide.

Figure : (Label the following diagram.)



Procedure :

1. Take three test tubes and label them as A, B and C.
2. Take about 5ml of solutions of potassium chloride in A, potassium bromide in B and potassium iodide in C.
3. Add about 5ml silver nitrate solution and stir it.
4. Keep test tubes on the stand and observe.

Observations :

Test Tube	Chemical Reaction	Colour of precipitate	ion
A	$KCl + AgNO_3 \longrightarrow KNO_3 + AgCl\downarrow$	White	chloride (Cl^-)
B	$KBr + AgNO_3 \longrightarrow KNO_3 + AgBr\downarrow$	light yellow	Bromide (Br^-)
C	$KI + AgNO_3 \longrightarrow KNO_3 + AgI\downarrow$	bright yellow	Iodide (I^-)

Inference / Conclusion :

1. Ions are precipitated in all the three reaction in the experiment.
2. Elements in the halogen family belonging to 17th group in the periodic table show similarity in their properties.
3. In this experiment depending on the colour of precipitate presence of chloride ion, bromide ion and iodide ion are confirmed.

Multiple Choice Questions

1. Valency of the elements in the halogen group is .....
   a. one b. two c. three d. four
2. The most reactive element in the halogen group is .....
   a. Astetine b. Iodine c. Chlorine d. Fluorine
3. The halogen which is liquid at room temperature is .....
   a. Fluorine b. Astetine c. Bromine d. Iodine
4. The metallic character of elements ..... in a group from top to bottom.
   a. increases b. decreases c. remains constant d. shows indefinite behaviour.
5. Valency of elements ..... in a period from left to right.
   a. Increases b. decreases
   c. remains constant d. increases in the beginning and then decreases.

: Exercise :

1. Observe the Modern Periodic Table and explain the gradation in reactivity of Halogen family.

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2. What are the similarities in properties of elements in Halogen family ?

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3. Why does Inert gases placed in Zero group ?

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Remark and Signature .....

PMPXYM

Practical No. 2

Aim : To identify the type of reaction by studying the reaction and recording the observations.

1. Combustion of magnesium in air.
2. Action of dilute sulphuric acid on zinc.
3. To heat lead nitrate.

Apparatus : Beaker, test tubes, pair of tongs, burner, glass rod, etc.

Chemicals : Zinc dust, magnesium strip, lead nitrate powder, dilute sulphuric acid.

Procedure :

Part I : Combustion of magnesium in air.

1. Hold a piece of magnesium strip on the flame of a burner.
2. Record the observation and write the reaction.

Reaction 1 :

$$2Mg + O_2 \longrightarrow 2MgO\ (s)$$

Observations :

1. The magnesium strip burns with luminous flame.
2. A white coloured powder remains behind.

Reaction	Number of reactants	Number of products	Interesting feature of the reaction	Type of the reaction
$2Mg+O_2 \longrightarrow 2MgO$	2	1	Mg burns in presence of O_2	combination reaction

Part II : Action of dilute sulphuric acid on zinc.

1. Take some zinc dust in a test tube.
2. Add 3 to 4 ml dilute sulphuric acid (dil. H_2SO_4) in it.
3. Record the observation and write the equation.

Reaction 2 :

$$Zn\ (s) + H_2SO_4\ (aq) \longrightarrow ZnSO_4\ (aq) + H_2$$

Observations :

1. A colourless gas is liberated.
2. A glowing splinter get extinguished and the gas burns with blue flame production a noise.
3. The zinc powder disappears and a colourless solution is obtained.

Reaction	Number of reactants	Number of products	Interesting feature of the reaction	Type of the reaction
$Zn + H_2SO_4 \longrightarrow ZnSO_4 + H_2$	2	2	Gas burns and noise is produced	Displace-ment reaction

Part III : To heat lead nitrate.

1. Take a one teaspoonful white coloured lead nitrate powder in a test tube.
2. Heat it on a burner.
3. Hold a moist blue litmus paper at the mouth of the test tube.
4. Hold a glowing splinter at the mouth of the test tube.
5. Record the observation and write the reaction.

Reaction 3 : $2Pb(NO_3)_2 \xrightarrow{\text{Heat}} 2\,PbO(s) + 4NO_2\uparrow + O_2\uparrow$

Observations :

1. A reddish brown coloured gas is liberated turning moist blue litmus paper red.
2. The glowing splinter keeps on glowing.

Reaction	Number of reactants	Number of products	Interesting feature of the reaction	Type of the reaction
$2Pb(NO_3)_2 \xrightarrow{\text{Heat}} 2\,PbO(s) + 4NO_2\uparrow + O_2\uparrow$	.....	.....	Simple substances are formed.	.....

Inference / Conclusion :

1. Reactions are called 'displacement reactions', when atom or group of atoms in one substance takes place of atom or group of atoms in the other substance to form new substances.
   For example, action of dilute sulphuric acid on zinc.
2. Reaction are called 'combination reactions', when a single product is formed from two or more reactants in a chemical reaction.
   For example, the reaction between magnesium and oxygen.
3. When two or more simpler substances are formed from a single compound, the reaction is called 'decomposition reaction'. For example, heating lead nitrate.

Multiple Choice Questions

1. Rusting of an iron nail is a ..... reaction.
   a. combination b. displacement c. decomposition d. double displacement

2. The following change is observed on dipping a litmus paper in aqueous solution of MgO.
   a. Red litmus turns blue, therefore MgO is alkaline.
   b. Blue litmus turns red, therefore MgO is acidic.
   c. No colour change in litmus paper, therefore MgO is neutral.
   d. Litmus paper is decolourised, therefore MgO acts as bleaching agent.

3. What is the colour of a solution formed on dipping a piece of zinc in dilute sulphuric acid?
   a. colourless b. colourless solution turns red c. black d. red

Practical No. 3

Aim : To observe the following reactions and to classify them into the types combination, displacement, decomposition and double displacement.

Reaction :

1. Reaction of water with (Calcium Oxide) lime.
2. Effect of heat on ferrous sulphate.
3. Reaction of copper sulphate solution with iron nail.
4. Reaction of solutions of sodium sulphate and barium chloride with each other.

Apparatus : 250 ml beaker, china dish, asbestos sheet, dropper, hard glass test tube, test tube holder, test tube stand, sand paper, burner / spirit lamp, filter paper etc.

Chemicals : Calcium oxide, water, crystals of ferrous sulphate, iron nail / wire scrubber, solution of copper sulphate.

Procedure :

A. Reaction of water with slaked lime.

1. Take about 10 gm lime in a clean and dry china dish, place this dish on an asbestos sheet.
2. Take a little water in a beaker, using dropper sprinkle some water on the lime in the dish. Record your observations.

Observation :

Sr.No.	Experimental procedure	Obsertvations
1	Note the heat absorbed or evolved during the reaction by touching the dish.	....
2	Note whether a gas or vapour is given away in the reaction.	....
3	Note the noise, if, any, produced during the reaction.	....
4	Note the change in the physical state	....

Reaction :

$$\underset{\text{calcium oxide}}{CaO(S)} + \underset{\text{water}}{H_2O(l)} \longrightarrow \underset{\text{calcium hydroxide}}{Ca(OH)_2(aq)}$$

Inference / Conclusion :

The reaction of water with lime is ..... reaction. Here calcium oxide and water react to form .....
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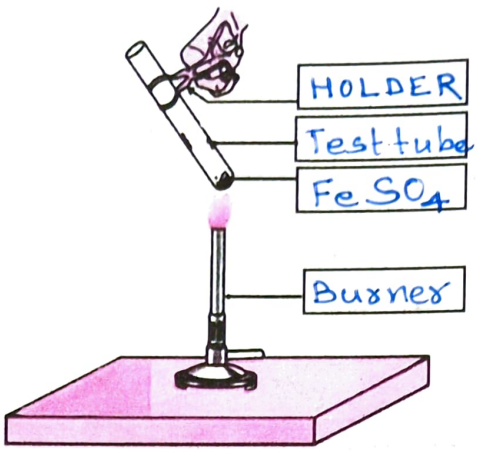
Procedure :

B. Effect of heat on crystals of ferrous sulphate

Figure : (Label the following diagram.)



Procedure :

1. Take about 10 gm of powdered crystals of ferrous sulphate in a test tube.
2. Clamp the test tube to a stand and heat it with burner /spirit lamp for 10 minutes.
3. Note the colour of the gas evolved. (Do not smell the gas).
4. Continue heating until the colour of the substance in the test tube changes.
5. Keep the hot test tube on an asbestos sheet. Observe the colour of the substance in it after cooling.

Observation :

Sr.No.	Experiment procedure	Obsertvations
1	Note the original colour of ferrous sulphate.	Pale green
2	Note the colour of the gas evolved on heating.	colourless
3	Observe the colour of the substance in the cold test tube and note it.	Dark-brown

Reaction :

$$2(FeSO_4.7H_2O)\ (s) \xrightarrow{\text{Heat}} Fe_2O_3\ (s) + SO_2(g) + SO_3(g) + 14H_2O(g)$$

Inference / Conclusion :

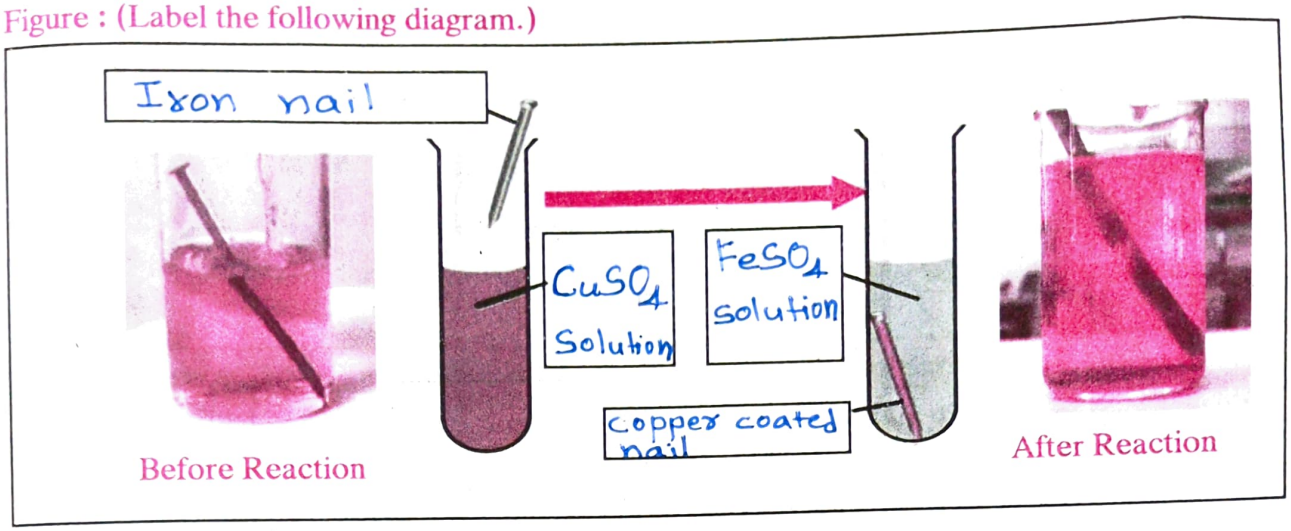
1. On heating the pale green coloured crystals of ferrous sulphate undergo decomposition. A mixture of ..SO_2.. and ..SO_3..... gases formed.
2. A residue of dark-brown colour remains in the test tube.

3. This is decomposition reaction.

Procedure :

C. Reaction of solution of copper sulphate with iron nail.

Figure : (Label the following diagram.)



Procedure :

1. Take about 100 ml solution of copper sulphate in a beaker. Note its colour.
2. Take two-three unrusted iron nails. Clean them by rubbing with sand paper and wash with water. Note the colour of the nails.
3. Keep the nails immersed in the copper sulphate solution for about fifteen minutes.
4. Observed the change in the colour of the nails and the solution.
5. Remove the nails from the solution after fifteen minutes. Wash them and keep them on a filter paper. Note the changed colour of the nails and the solution.

Observation Table:

Sr.No.	Experiment procedure	Obsertvations
1	Colour of $CuSO_4$ sol^n. before the experiment.	Blue
2	Colour of iron nail before the experiment.	Steel grey
3	Colour of $CuSO_4$ sol^n. after the experiment.	Light blue / greenish
4	Colour of iron nail after the experiment.	Reddish- brown

Reaction :

$$Fe\,(s) + CuSO_4(aq) \longrightarrow FeSO_4(aq) + Cu(s)$$

Inference / Conclusion :

1. On immersing the brown coloured iron nails in blue coloured copper sulphate solution, they displace copper from the copper sulphate solution and their colour becomes reddish-brown
2. This is a displacement reaction.

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Procedure :

D. The reaction between sodium sulphate and barium chloride :

1. Take about 20 ml sodium sulphate solution in a clean beaker. Note the colour and nature.
2. Take 10 to 15 ml barium chloride solution in a test tube. Note its colour and nature.
3. Pour the barium chloride solution from the test tube slowly into the sodium sulphate solution in the beaker.
4. Keep on stirring the solution in beaker.
5. Observe the changes occur in beaker and note it down.

Observation Table :

Sr.No.	Experiment procedure	Obsertvations
1	The colour and the nature of the sodium sulphate solution before the experiment.	Clear and transparent
2	The colour and the nature of the barium chloride solution before the experiment.	Clear and transparent
3	The colour and the nature of the mixture resulting on mixing the two solution into each other.	white precipitate is formed

Reaction :

$$BaCl_2(aq) + Na_2SO_4(aq) \longrightarrow BaSO_4(aq) + 2NaCl(aq)$$

In this chemical reaction two new compounds are formed by mutual exchange of the components (ions or radicals) of the two compounds. Such reactions are called 'double displacement' reactions.

Inference / Conclusion :

1. In this reaction white coloured insoluble $BaSO_4$ is formed. As a result of a white coloured precipitate is formed in the beaker.

Multiple Choice Questions

1. The reaction of water with slaked lime is studied by .....
   a. putting slaked lime into water taken in a test tube.
   b. putting a lot of water into slaked lime.
   c. sprinkling a little water on slaked lime.
   d. None of the above method.
2. When ferrous sulphate crystals are heated, the residue obtained in the test tube is .....
   a. red coloured b. blue coloured c. green coloured d. colourless
3. When sodium sulphate solution reacts with barium chloride solution, the solution after the reaction contains mainly .....
   a. barium sulphate b. sodium chloride c. a and b both d. none of a and b
4. The reaction of iron nail with copper sulphate solution is ..... reaction.
   a. combination b. decomposition c. displacement d. double displacement

5. The reddish brown colour obtained on the iron nail placed in copper sulphate solution is of .....

a. Cu_2O b. CuO c. Cu d. CuS

: Exercise :

1. "To pour water on calcium oxide." Which is another way to classify this reaction? Explain.

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2. In experiment (C), speed of reaction increases if we use iron wire scrubber instead of iron nail. Which factor do you observe that affects the rate of reaction? Explain.

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3. Name the substance which remains in a test tube after heating ferrous sulphate.

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4. Observe double displacement reactions given in the text book and write down the similarities.

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Remark and Signature .....

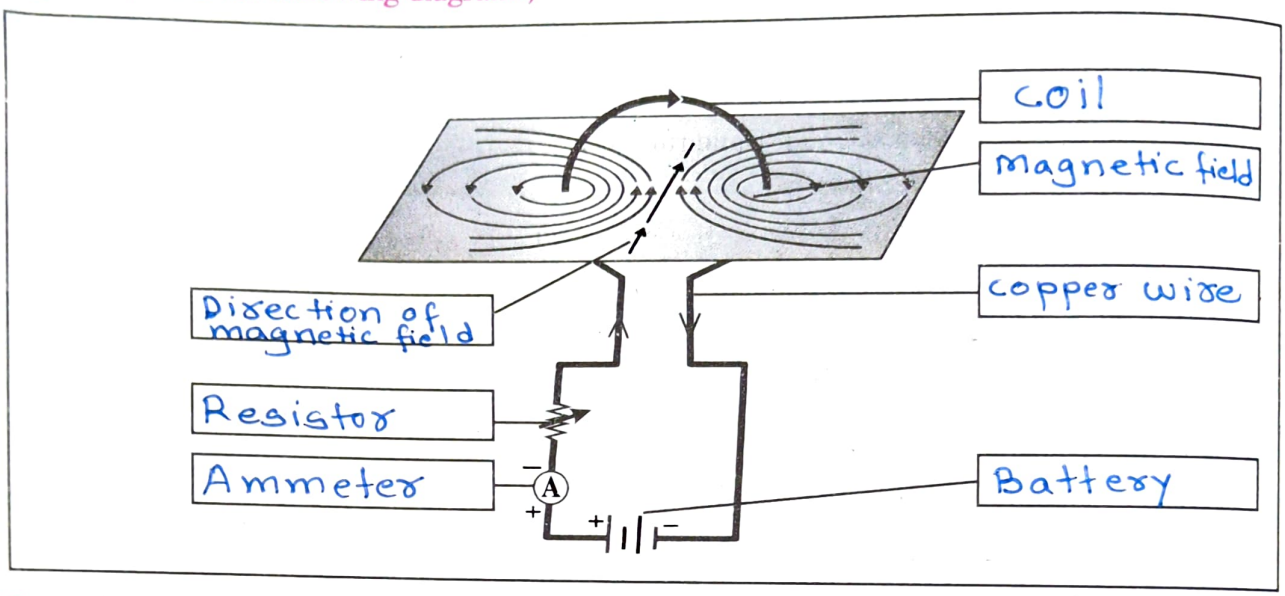
PVPPSS

Practical No. 4

Aim : To study the magnetic field due to electric current flowing through the coil.

Apparatus : Insulated copper wire(24 gauge), connecting wires, battery (12V), cardboard/ plastic sheet, iron fillings etc.

Figure : (Label the following diagram.)



Procedure :

1. Make a coil around the hollow tube with around 20 to 25 rounds of copper wire.
2. Arrange coil and cardboard / plastic sheet as shown in the figure.
3. Spread some iron filings on the cardboard.
4. Connect both ends of coil to the battery and start the electric current.
5. Keep flicking gently on the cardboard and observed the arrangement of iron filings.
6. Increase the current in circuit gradually and observe the change in the arrangement of iron filings.

Observation :

1. When electric current starts flowing through the coil, magnetic lines of force are produced at each point on the coil.
2. As we go away from the wire, the concentric circles representing the magnetic lines of forces will become larger and larger.
3. As intencity of electric current increases the magnetic lines of force becomes more clearer.

Inference / Conclusion :

1. If the current flows through the coil, magnetic lines of force are produced at each point on the coil.
2. In above expertiment, the intensity of magnetic field at any point by a current flowing through a coil, is dependent on the current and the number of turns of wire forming a coil.

Multiple Choice Questions

1. In above experiment ..... would be use to find direction of magnetic lines of force.
   a. bar magnet b. horse shoe magnet
   c. disc magnet d. magnetic needle
2. When electric current is passed through the solenoid, its shows magnetic lines of force similar to a .....
   a. bar magnet. b. horse shoe magnet.
   c. disk magnet. d. spherical magnet.
3. In ..... appliance Fleming Left Hand rule is not used.
   a. electric fan b. mixer c. computer d. electric generator
4. Heating effect of electric current does not observed in .....
   a. electric oven. b. electric iron. c. elecric motor. d. fuse.
5. ..... is used to measure electric resistance in a circuit.
   a. Voltmeter b. Galvanometer c. Ammeter d. Ohm meter

: Exercise :

1. What is the reason behind covering wires carring electricity with rubber in some places?

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2. What procedure will you follow to study magnetic field, if you are provided with parafin oil, iron nail, bar magnet, battery, coil conductor wire?

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2. Which magnet will you choose among permanent magnet and electromagnet for Industrial purpose? Justify your answer.

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Remark and Signature .....

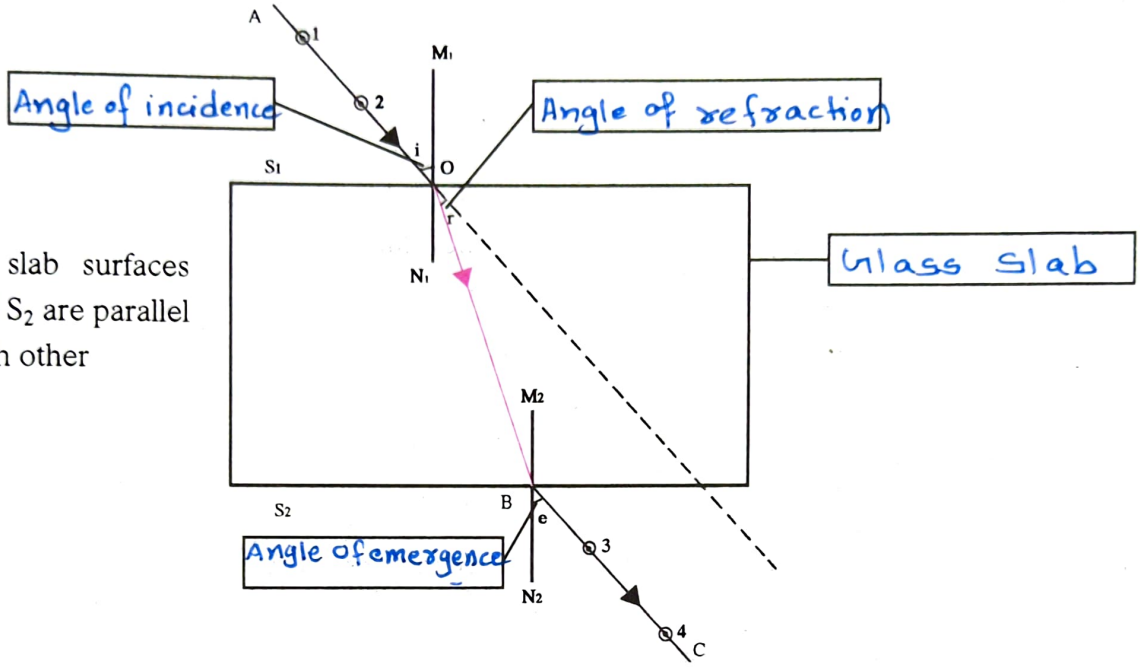
PVYKUF

Practical No. 8

Aim : To verify the laws of refraction of light.

Apparatus : A glass slab, drawing board, drawing pins, paper pins, drawing sheet, etc.

Figure : (Label the following diagram.)



Glass slab surfaces S_1 and S_2 are parallel to each other

Procedure :

1. Take the drawing paper and fix it on the drawing board properly by using drawing pins.
2. Place the given glass slab at the center and draw its projections on the paper with a pencil.
3. Remove the slab and at point O, draw a normal M_1N_1 at the point O. Also, draw the ray AO at an angle of 30^0 with the normal.
4. Fix two paper pins 1 and 2 as the ray AO.
5. Now place the glass slab in its original place, look at the images of the paper pins 1 and 2 from the other side of the slab, and fix two more pins 3 and 4 in such a way that they are on the line joining the pins 1 and 2. The ray BC shows the emerging ray.
6. Remove the slab and join OB. Draw a normal M_2N_2 at the point B.
7. Measure the angle of incidence (i), the angle of refraction (r) and the angle of emergence (e).
8. Repeat the same procedure for 45^0 and 60^0.

Observation :

Sr.No.	Angle of incidence (i)	Angle of refraction (r)	Angle of emergence (e)
1	30^0	20°	30°
2	45^0	25°	45°
3	60^0	35°	60°

Inference / Conclusion :

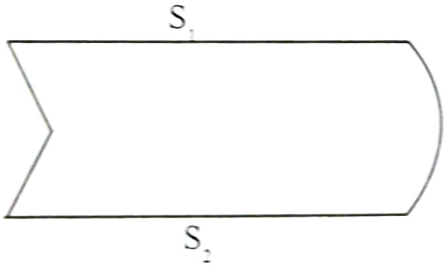
1. When light undergoes refraction through a glass slab, the incident ray and emergent ray are parallel to each other.
2. The angle of incidence and the angle of emergence are of same measures.

Multiple Choice Questions

1. One student is doing experiment to draw the path of light rays passing through a glass slab. For this, he measured the angle of refraction and angle of emergence for every angle of incidence. In all the cases he found that..... .
   a. The angle of incidence is larger than the angle of refraction, but is almost equal to the angle of emergence.
   b. the angle of incidence is smaller than the angle of refraction, but it is almost equal to the angle of emergence.
   c. the angle of incidence is larger than the angle of refraction and also it is larger than the angle of emergence.
   d. the angle of incidence is smaller than the angle of refraction, and also it is smaller than the angle of emergence.
2. When a light ray makes an angle of 90^0 while entering a glass slab from air, it .....
   a. bends towards the normal. b. goes away from the normal.
   c. goes straight without bending at point O. d. returns back into the air.
3. A light ray entering glass from water, ...
   a. it goes away from the normal. b. it bends towards the normal.
   c. it travels straight without bending. d. it returns back into water.
4. A ray of light makes an angle of 50^0 with the surface S_1 of the glass slab. Its angle of incidence will be .....
   a. 50^0 b. 40^0 c. 140^0 d. 0^0
5. In a glass filled with water a coin placed at the bottom, if viewed in a skew angle the coin is found .....
   a. at the bottom. b. floating in a water. c. bent. d. breaked.

: Exercise :

1. If the glass slab is of the following shape, and the experiment is performed as above, will the effects be the same? Here, S_1 and S_2 are slab surfaces parallel to each other.



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2. "During refraction of light through the glass slab, incident ray and emergent ray are parallel to each other." Explain.

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3. What would be the path of refracting ray and emergent ray, if two glass slab kept attached to each other.

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Remark and Signature .....

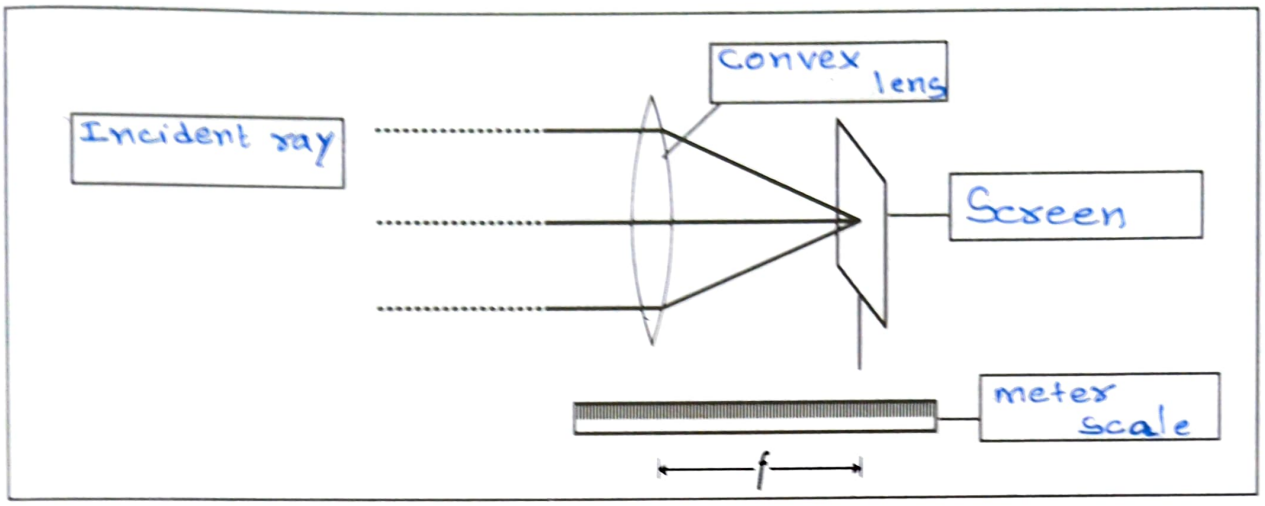
PX1521

Practical No. 10

Aim : To obtain the focal length of a convex lens.

Apparatus : Convex lens, lens holder, meter scale, screen with a stand, etc.

Figure : (Label the following diagram.)



Procedure :

1. Fit a convex lens in the lens holder.
2. Spot a distant object such as electric pole, a tree or a building.
3. Fit the screen on the stand and place it on the other side of the lens (opposite to object side.)
4. Move the screen back and forth to obtain a clear image of the chosen object on it.
5. Measure the distance between the lens and the screen.
6. Repeat the above steps two more times.
7. Now rotate the lens by 180^0 and repeat the above procedure.

Observation :

Least count of the meter scale = ...1.... mm

Observation Table 1

Convex lens front surface facing the object

No.	Distant Object	Distance betwen lens center and screen
1	Building	21 cm
2	Gate	21 cm
3	Door	21 cm
	Average F1	21 cm

Observation Table 2

Convex lens back surface facing the object

No.	Distant Object	Distance betwen lens center and screen
1	Building	21 cm
2	Gate	21 cm
3	Door	21 cm
	Average F2	21 cm

Inference / Conclusion :

1. First focal length of the convex lens (F_1) ....21.....cm
2. Second focal length of the convex lens (F_2)...21.....cm
3. From 1 and 2 above, is the lens used in this experiment a symmetric lens? (Yes / ~~No~~)
   If $F_1 = F_2$, then the lens is symmetric.

Multiple Choice Questions

1. A student obtain a clear image of window bars on a screen with the help of a convex lens. But in order to have the best image, his teacher suggested him to obtain the image of a distant tree. Where will the lens has to be moved in order to obtain a clear image?
   a. away from the screen b. behind the screen
   ✓c. towards the screen d. at a very long distance from the screen
2. If you want to make a Refracting Telescope, what components will you choose ?
   a. One convex lens and one concave lens.
   ✓b. Two convex lenses.
   c. One concave mirrror, one plane mirror and one convex lens.
   d. One concave mirror, one convex mirror and one convex lens.
3. The image obtained while finding the focal length of convex lens is .....
   a. a real and erect. b. virtual and erect. ✓c. real and inverted. d. virtual and inverted .
4. For the same thickness of the lens, if the radius of curvature is increased, the focal length will .....
   a. reduced. b. remain unchanged. ✓c. increased. d. be imposible to estimate.
5. At what distance a watch maker must hold his lens from the watch?
   a. at the focal length ✓b. at less than focal lengh
   c. at more than the focal length d. at zero distance

: Exercise :

1. Explain the working of compound microscope by focal length of convex lens.
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2. When would virtual image produced by convex lens? Why doesn't virtual image drawn on a screen?
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3. Give your opinion about radius of curvature of a convex lens having different F_1 and F_2? What would the lens called having equal F_1 and F_2 ?
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Remark and Signature .....

PXIW5B