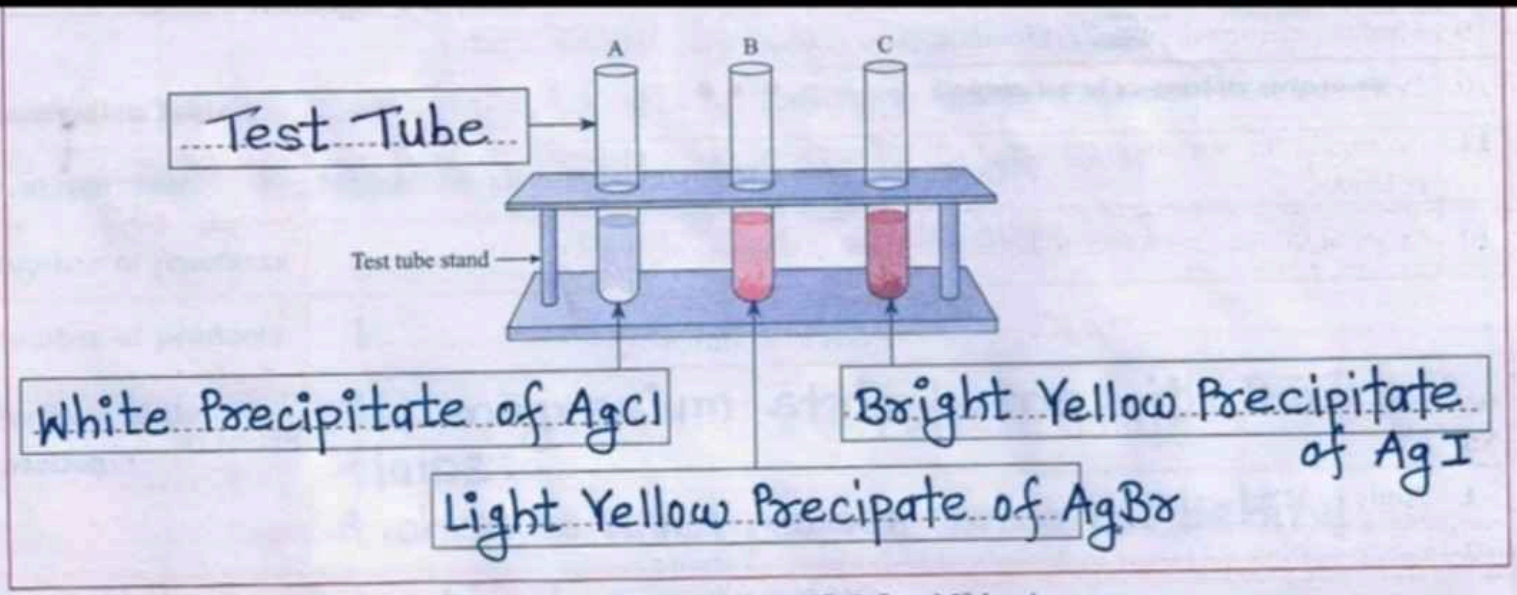
PRACTICAL NO. 1



Identification of halide ions (Cl^-, Br^- and I^- ions)

Observation table :

Test Tube	Reaction/Test	Colour of Precipitate	Inference
A	$KCl + AgNO_3$	White	Chloride (Cl^-) present.
B	$KBr + AgNO_3$	Light yellow	Bromide (Br^-) present
C	$KI + AgNO_3$	Bright yellow	Iodide (I^-) present

Chemical reactions :

(1) $KCl_{(aq)}$ (Potassium chloride) + $AgNO_{3(aq)}$ (Silver nitrate) → $KNO_{3(aq)}$ (Potassium nitrate) + $AgCl_{(s)}\downarrow$ (White precipitate of silver chloride)

(2) $KBr_{(aq)}$ (Potassium bromide) + $AgNO_{3(aq)}$ (Silver nitrate) → $KNO_3(aq)$ (Pottassium Nitrate) + $AgBr(s)\downarrow$ (Light Yellow precipitate of silver bromide)

(3) $KI_{(aq)}$ (Potassium iodide) + $AgNO_{3(aq)}$ (Silver nitrate) → $KNO_3(aq)$ (Potassium Nitrate) + $AgI(s)\downarrow$ (Bright Yellow precipitate of Silver Iodide)

Inferences :

(1) Halide ions (Cl^-, Br^-, I^-) are precipitated in all the three reactions of above experiments.

(2) In the above experiment, depending on the colour of the precipitates, presence of Cl^-, Br^- and I^- in the given solutions are confirmed.

(3) Elements of halogen group in the periodic table show similar properties.

PRACTICAL NO. 2

Observation table :

Reaction/Test	Magnesium strip is burnt. $2Mg + O_2 \rightarrow 2MgO$
Number of reactants	2
Number of products	1
Features of the reaction	The magnesium strip burns with luminous flame. A white coloured powder remains behind.
Type of reaction	Combination reaction.

Chemical reaction : $2Mg_{(s)} + O_{2(g)} \longrightarrow 2MgO_{(s)}$

(Magnesium strip) (Oxygen) (Magnesium oxide)

Reaction of H_2SO_4 with zinc

Observation table :

Reaction/Test	Dilute sulphuric acid is added to zinc. $Zn + H_2SO_4 \rightarrow ZnSO_4 + H_2$
Number of reactants	2
Number of products	2
Features of the reaction	A colourless gas is liberated. The gas burns with blue flame produce a noise. The zinc powder disappears and a colourless soln is obtained.
Type of reaction	Displacement Reaction.

Chemical reaction : $Zn_{(s)} + H_2SO_{4(l)} \longrightarrow ZnSO_{4(s)} + H_{2(g)}$

(Zinc) (Dil. sulphuric acid) (Zinc sulphate) (Hydrogen gas)

Observation table :

Reaction	Lead nitrate is heated. $2Pb(NO_3)_2 \xrightarrow{Heat} PbO_{(s)} + 4NO_{2(g)} \uparrow + O_{2(g)} \uparrow$
Number of reactants	1
Number of products	3
Features of the reaction	Simple subtances are formed
Type of reaction	Decomposition Reaction

Chemical reaction : $2Pb(NO_3)_{2(s)} \xrightarrow{Heat} 2PbO_{(s)} + 4NO_{2(g)} \uparrow + O_{2(g)} \uparrow$

(Lead nitrate) (Lead oxide) (Nitrogen dioxide) (Oxygen)

PRACTICAL NO. 3

Observation table :

Experimental procedure	Observation
1. Water is added to quick lime.	There will be a rise in the temperature in china dish. Calcium oxide reacts with water to form Calcium hydroxide called slaked lime.
2. The noise produced in the reaction.	Hissing sound is produced due to heat.
3. The heat is absorbed or evolved during the reaction.	Due to rise in temperature of China Dish, heat is evolved.
4. A gas or vapour is formed during the reaction.	Water vapours are formed.
5. The change in the physical state.	Formed Slaked Lime is Solid at Room temperature.

Chemical reaction : $CaO_{(s)}$ + $H_2O_{(l)}$ ⟶ $Ca(OH)_{2(aq)}$ + Heat

Calcium Oxide (Quick lime) — (Water) — Calcium Hydroxide (Slaked lime)

Inferences :

(1) The reaction between quick lime and water is ...exothermic.... reaction.

(2) Here calcium oxide and water react to form ..Calcium Hydroxide.

(3) This is an example of ..Combination Reaction.

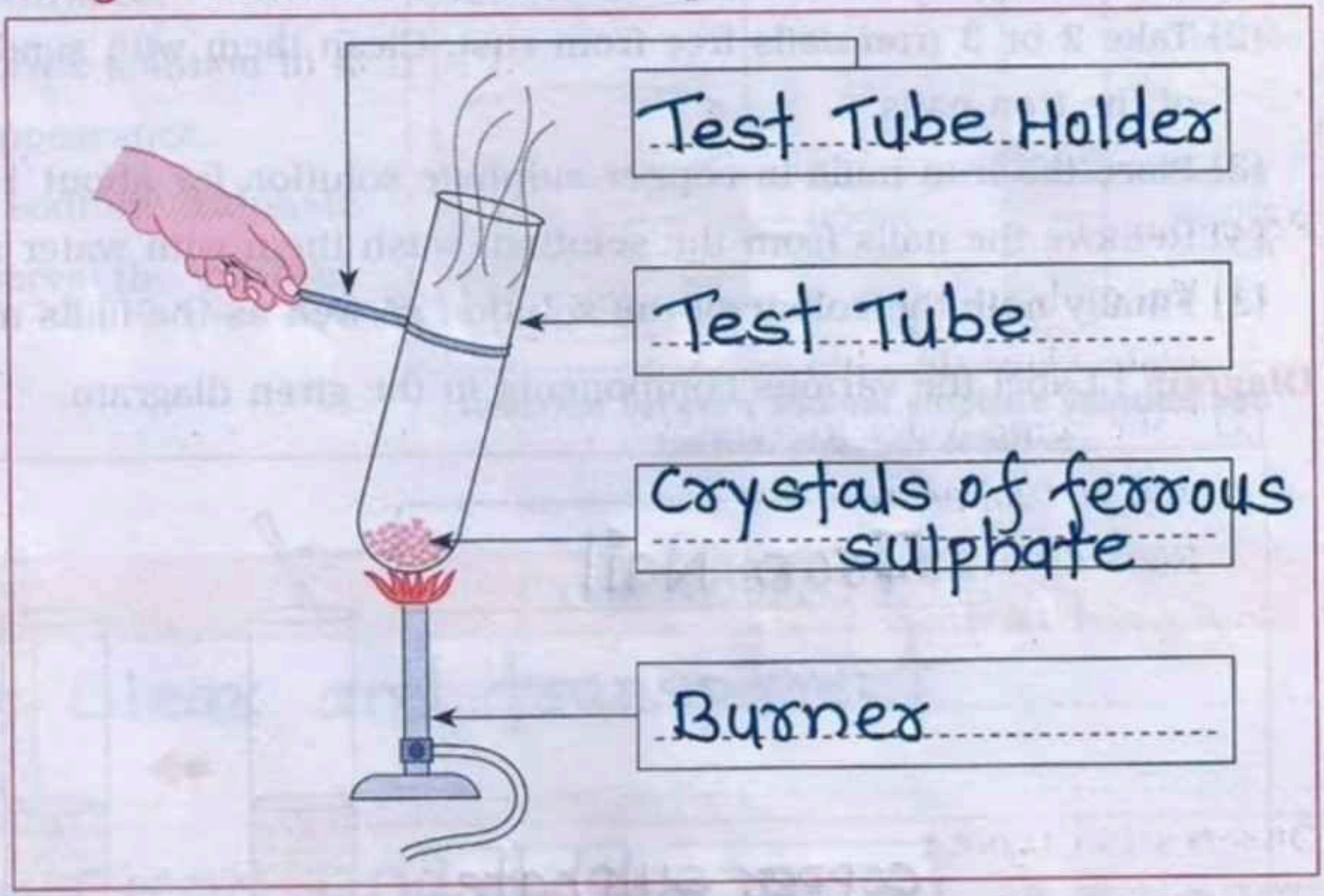
(4) The clear solution obtained after the suspension settles is called ..Lime Water.....

Precautions :

(1) Never put quick lime in water. It may cause the lime water splash out of the beaker and damage eyes or skin.

(2) Do not touch or dip your finger in lime water.

Diagram : Label the various components in the given diagram.



Effect of heat on ferrous sulphate crystals

Observation table :

Experimental procedure	Observation
1. The original colour of Ferrous sulphate.	Light Green
2. Ferrous sulphate is heated.	A mixture of SO_2 and SO_3 gases formed and forms a residue of dark brown colour.
3. Colour of the gas evolved during heating.	Colourless gas with odour of burning sulphur.
4. The colour of the substance in the cold test tube.	Light Green → White → Dark Brown

Chemical reaction : $2(FeSO_4.7H_2O) \xrightarrow{\Delta} Fe_2O_{3(s)} + SO_{2(g)} + SO_{3(g)} + 14H_2O_{(g)}$

Inferences :

(1) Light green crystals of ferrous sulphate on heating underg

.SO3... gases formed.

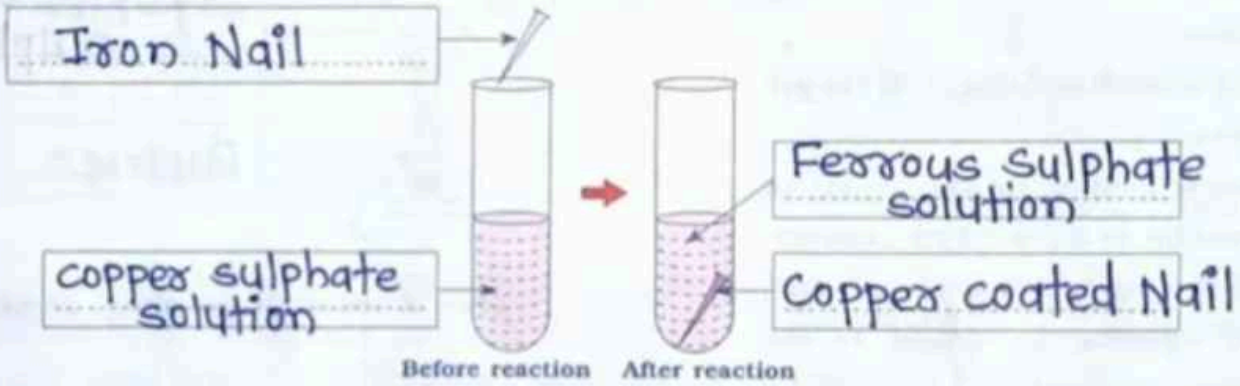
(2) A residue of dark brown colour remains in the test tu

(3) This is an example of decompasi-tion reaction.

Precautions :

(1) Use hard glass test tube for heating the substance.

(2) During heating, keep the test tube away from you.



Observation table :

Experimental procedure	Observation
1. Colour of copper sulphate solution before the experiment.	Sky Blue
2. Colour of iron nail before the experiment.	Steel Grey
3. Colour of copper sulphate solution after the experiment.	Pale Green
4. Colour of iron nail after the experiment.	Reddish Brown

Chemical reaction : $Fe_{(s)} + CuSO_{4\,(aq)} \rightarrow FeSO_{4\,(aq)} + Cu_{(s)}\downarrow$

Iron (Steel Grey) + Copper sulphate (Blue) → Ferrous sulphate (Light Green) + Cu↓

Inferences :

(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.

Precaution : Clean the iron nails by rubbing with sandpaper for effective result.

(D) Reaction between sodium sulphate solution and barium chloride solution

Observation table :

Experimental procedure	Observation
1. The colour and appearance of sodium sulphate solution before the reaction.	Clear and transparent
2. The colour and appearance of barium chloride solution before the reaction.	Clear and transparent
3. The colour and appearance of the mixture after mixing two solutions.	White colour insoluble Precipitate is formed.

Chemical reaction :

$$\underset{\text{Sodium sulphate (colourless)}}{Na_2SO_{4\,(aq)}} + \underset{\text{Barium chloride (colourless)}}{BaCl_{2\,(aq)}} \longrightarrow \underset{\text{Barium sulphate (white)}}{BaSO_{4\,(s)}\downarrow} + \underset{\text{Sodium chloride (colourless)}}{2NaCl_{(aq)}}$$

Inferences :

(1) 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.

(2) In this reaction, white coloured insoluble Barium Sulphate is formed.

(3) This is a double displacement reaction.

Precaution : Clean the apparatus thoroughly before using it.

Date : _____ **Teacher's Signature :** _____

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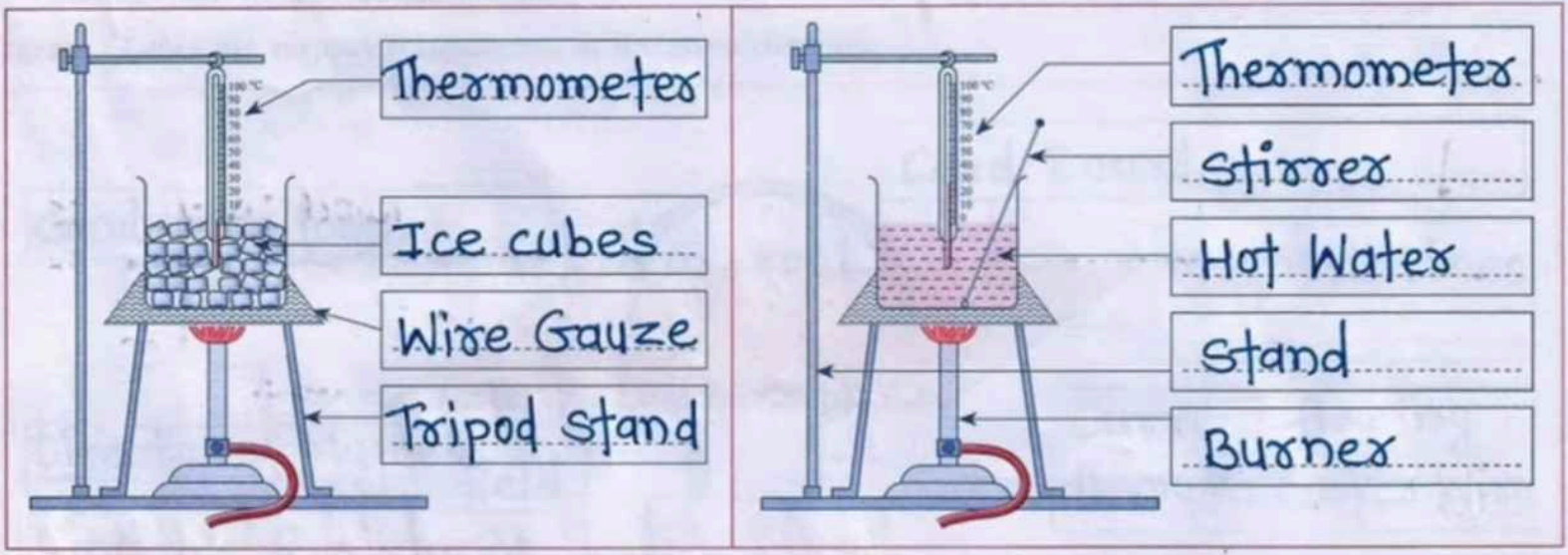
PRACTICAL NO. 5

iagrams : Label the various components in the given diagram.



Effect of heat on ice

Observations :

(1) Least count of the thermometer = 0.2 °C.

(2) The temperature of the mixture of ice and water remains 0°C till the ice melts completely.

(3) As heating is continued, the temperature goes on increasing from 0°C to 100°C.

(4) The temperature of water remains constant (100°C) even after it starts boiling.

Observation table :

Time (min)	0	1	2	3	4	5	6	7	8	9	10	11	12	13
Temperature (°C)	0	0	0	0	0	5	10	16	22	27	33	39	44	50

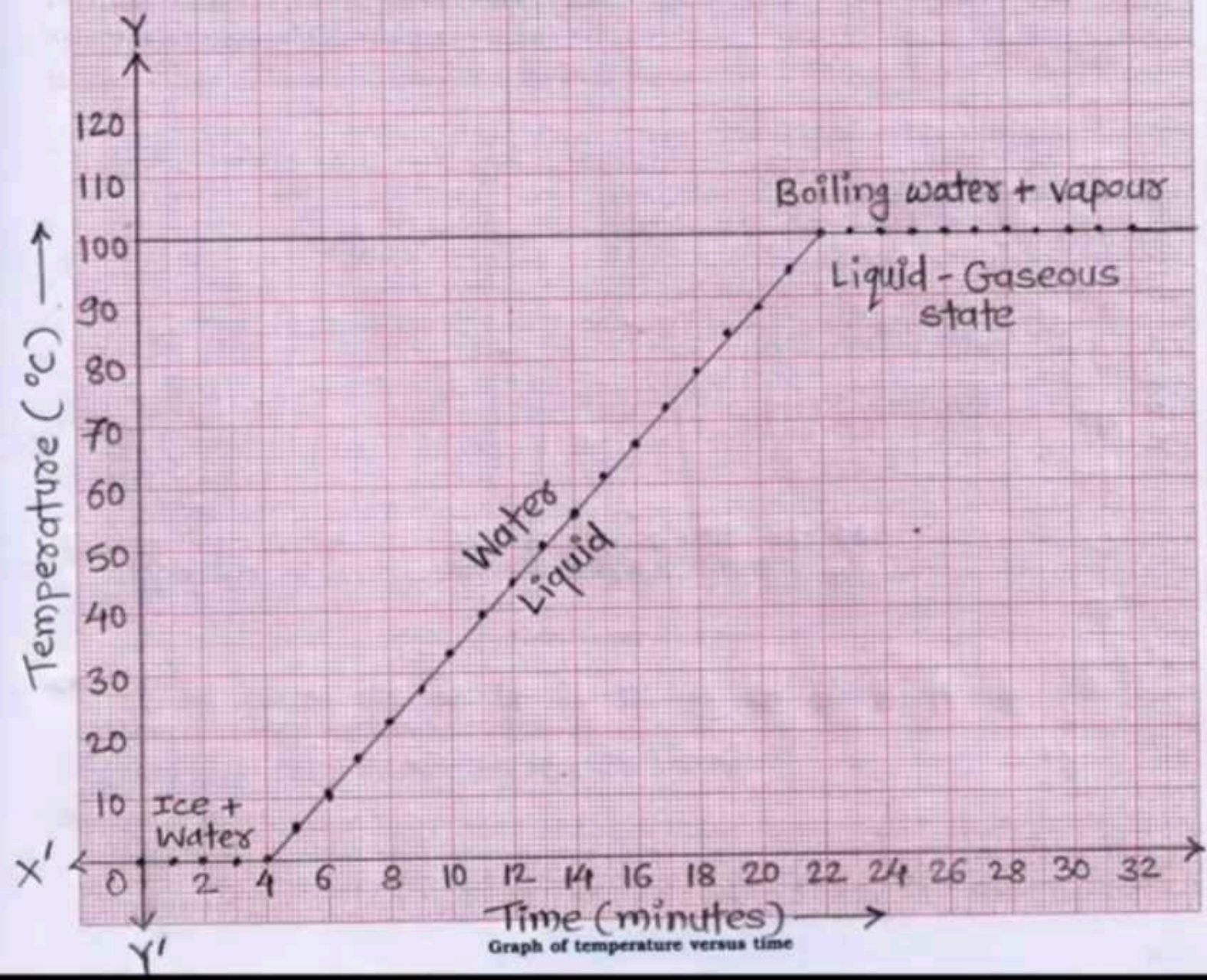
Time (min)	14	15	16	17	18	19	20	21	22	23	24	25	26	27
Temperature (°C)	55	61	66	72	78	84	88	94	100	100	100	100	100	100

Time (min)	28	29	30	31	32	33	34	35	36	37	38	39	40
Temperature (°C)	100	100	100	100	100	-	-	-	-	-	-	-	-

Scale

X- axis : 1 cm = 2 min

Y- axis : 1 cm = 10°C

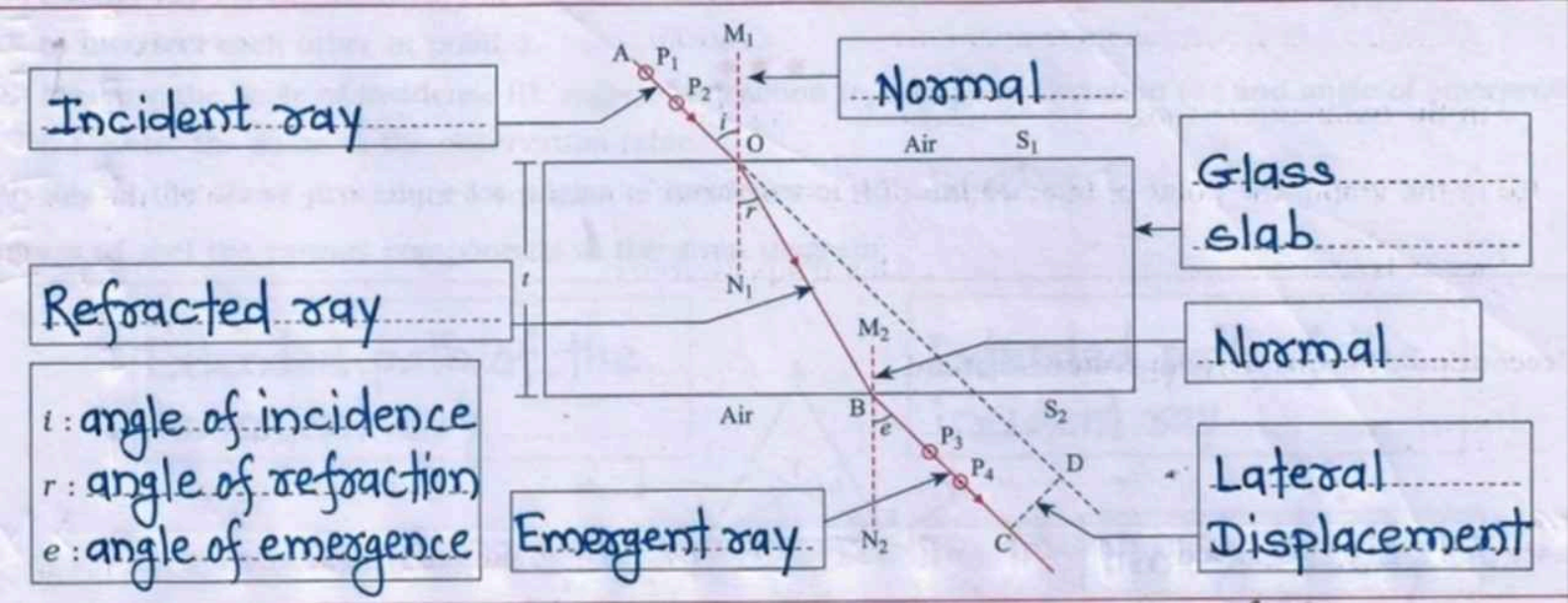


Graph of temperature versus time

Inference/Conclusion : The thermometer shows rise in temperature only after melting of ice. When we heat the ice and water, energy supplied is utilized in melting the ice and the temperature does not change till all the ice melts because of the latent heat of fusion. On further heating, the temperature of the water would increase upto 100°C. Thenafter, even though heat energy is supplied to water, its temperature does not rise.

Precaution : The bulb of the thermometer should not touch the bottom of the beaker.

PRACTICAL NO. 8


Incident ray
Normal
Glass slab
Refracted ray
Normal
i : angle of incidence
r : angle of refraction
e : angle of emergence
Emergent ray
Lateral Displacement
A
P1
P2
M1
O
i
r
Air
S1
t
N1
M2
B
e
P3
P4
D
C
N2
Air
S2

Refraction of light through a glass slab

$\mu = \frac{\sin i}{\sin r} = 1.5$

Observation : The path of the ray for angle of incidence of 30°/45°/60° is AOBC.

Observation table :

Angle of incidence (i)	Angle of refraction (r)	Angle of emergence (e)	$\frac{\sin i}{\sin r}$
30°	20°	29°	1·46
45°	29°	46°	1·45
60°	36°	59°	1·47

Inferences/Conclusions :

(1) Incident ray AO and emergent ray BC are parallel to each other . The lateral shift is equal to CD . [This shift depends upon the thickness of the glass slab, the refractive index of glass and the angle of incidence .]

(2) The angle of incidence (*i*) is greater than the angle of refraction (*r*). This means when a ray of light travels from air to glass, it bends towards the normal .

(3) The angle of incidence (*i*) is equal to the angle of emergence (*e*).

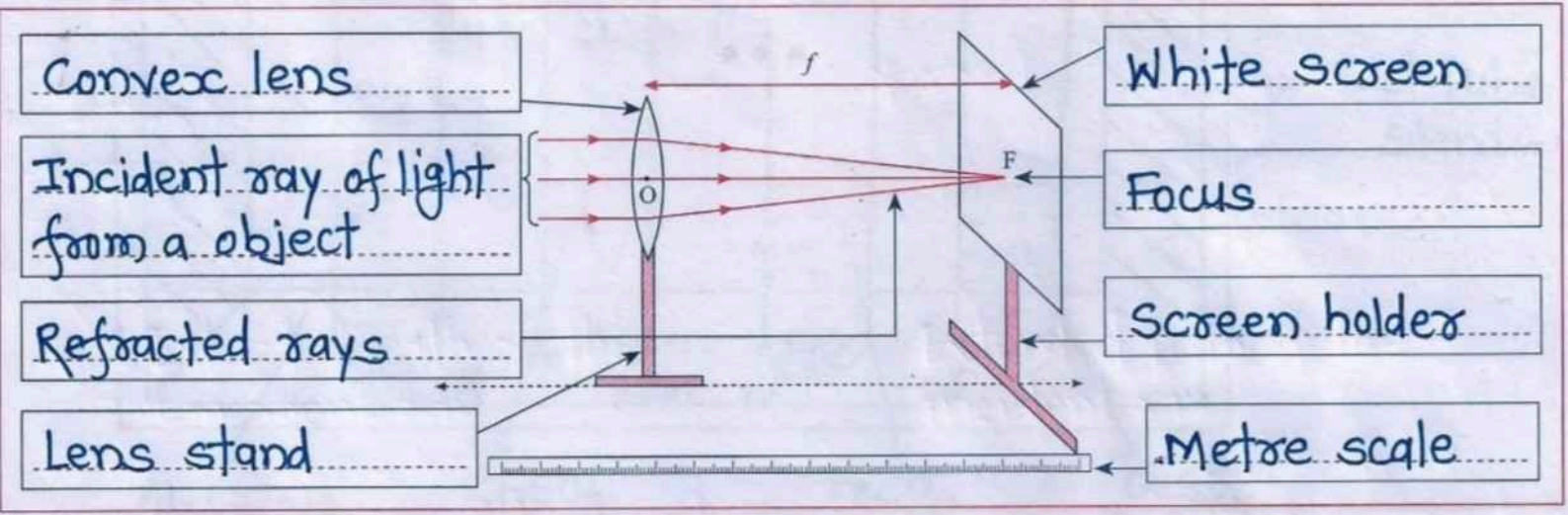
(4) The incident ray and the refracted ray are on the opposite sides of the normal to the surface at the point of incidence and all the three i.e., the incident ray , the refracted ray and the normal are in the same plane.

(5) For a given pair of media, the ratio of angle of incidence to angle of refraction is constant (Snell's law). This constant is called the refractive index of the second medium with respect to the first medium.

Precaution : Pins should be fixed such that they are vertical and well separated.

PRACTICAL NO. 10

agram : Label the various components in the given diagram.



Determination of the focal length of a convex lens

Observation table :

Sr. No.	Distant object	Distance between the lens and the screen (cm)		Average focal length of the lens $f = \frac{f_1 + f_2}{2}$ (cm)
		for one surface of the lens towards the object (f_1)	for the other surface of the lens towards the object (f_2)	
1	Tree	24 cm	23 cm	$f = \frac{24+23}{2} = \frac{47}{2}$ $\therefore f = 23.5$ cm

2	Electric Pole	17 cm	16 cm	$f = \frac{17+16}{2} = \frac{33}{2}$ $\therefore f = 16.5$ cm
3	Building	22 cm	23 cm	$f = \frac{22+23}{2} = \frac{45}{2}$ $\therefore f = 22.5$ cm
		Average f_1 = 21..	Average f_2 = 20.66	Average f = 20.83

Inferences/Conclusions :

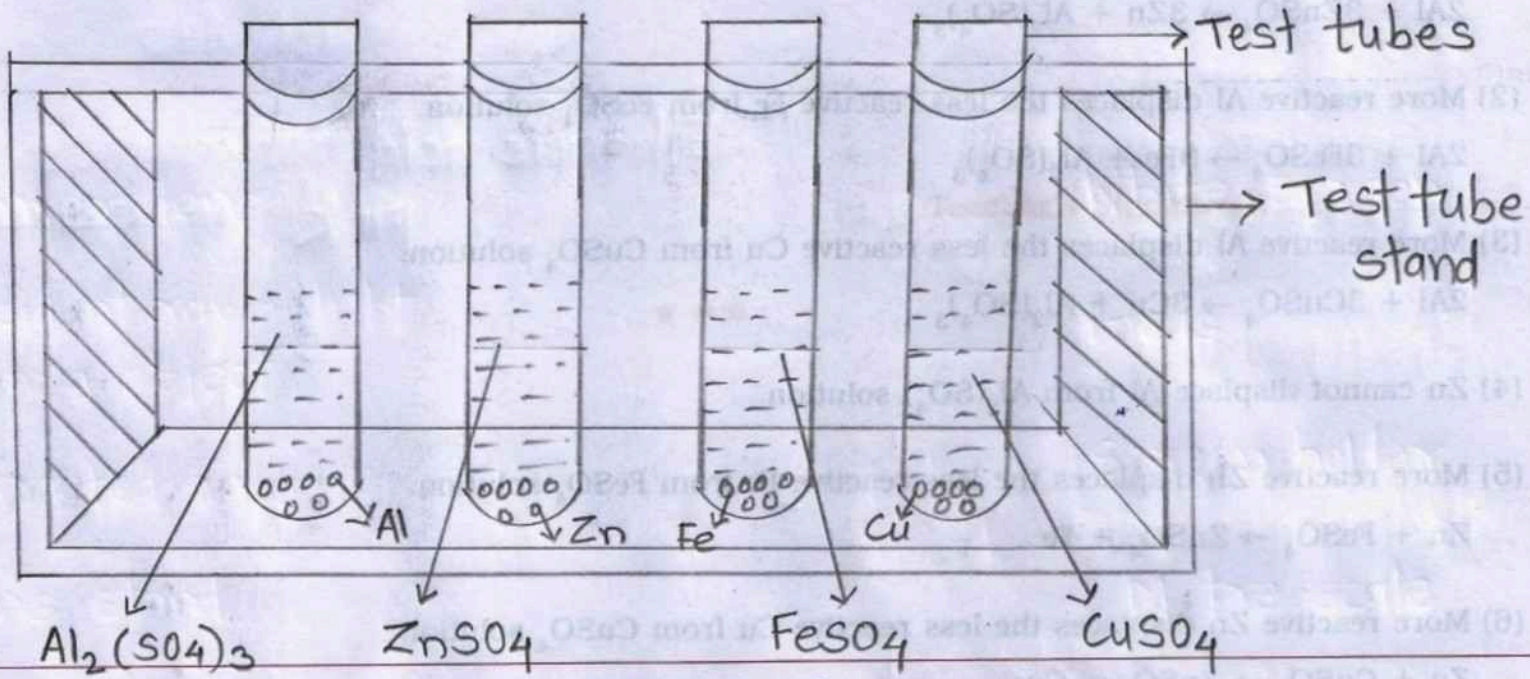
(1) The average focal length of the lens (f) = 20.83 cm.

(2) f_1 ... = ... f_2. (Use proper sign, =, ≠)

(3) The lens used is symmetric / is not symmetric.

PRACTICAL NO. 11

: Draw and label the diagrams of metals with the solutions of salts.



Inferences :

(1) Aluminium displaces Zn , Fe and Cu from their salt solutions.

(2) Zinc displaces Fe and Cu from their salt solutions.

(3) Fe displaces Cu from its salt solution.

(4) Cu cannot displace Zn , Al or Fe from their salt solutions.

(5) Thus, aluminium is more reactive metal.

The decreasing order of reactivity of metal is :

Al > Zn > Fe > Cu

Most reactive

(Reactivity in decreasing o

PRACTICAL NO. 12

Chemical reaction : $CH_3 - CH_2 - OH \xrightarrow[\text{alkaline } KMnO_4]{(O)} CH_3 - COOH$

(Ethanol) (Ethanoic acid)

Inferences :

(1) Potassium permanganate oxidizes ethanol to Ethanoic acid.

(2) As potassium permanganate is consumed in this reaction its pink colour vanishes.

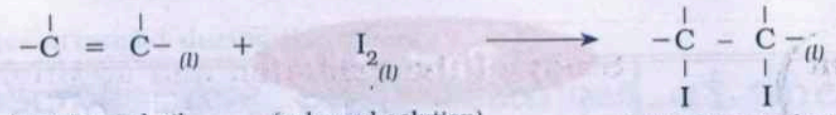
(3) When oxidation process is over, the potassium permanganate added afterwards becomes excess and shows its presence with its particular pink colour.

(B) Addition Reaction of Fatty Acids

Observation table :

Sr. No.	Oil used	Colour change observed in the solution
1.	Groundnut oil	orange brown colour of tincture iodine vanishes
2.	Safflower oil	coloured to colourless
3.	Sunflower oil	coloured to colourless
4.	Vanaspati ghee	no colour change

Chemical reaction :



(unsaturated oil molecule) (coloured solution) (colourless product)

Inferences :

(1) Iodine is consumed due to its addition to fatty acid. Therefore, the coloured solution becomes colourless.

But when the same procedure is followed for vanaspati ghee, a similar colour change is not observed. As vanaspati ghee is saturated hydrocarbon, the ...addition..... reaction does not occur there.

(2) The iodine test indicates the presence of a .....starch..... in vegetable oil.