university of rajasthan

Chemistry practical Exam

B.Sc. Semester-2 nd (chemistry)Practical-(a)

duration _4hrs

Max Marks-10*40. Min marks 4*+16

Ex:1 separation and identification of six radical (3 cation and 3 anion) in the given inorganic mixture. (10)

Acidic radical: NO2-,Cl-,SO4-2

Basic radical:NH4+,cd+2,mg+2

Ex2 Synthesis of 2,4-dinitrophenylhyrazones of any aldehyde /ketone.

Ex:3. To Study the effect of Acid Strength on the Hydrolysis of an ester. (10)

Ex: 4 Viva Voice (5)

Ex:5 Record (5)

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Chemistry practical Exam

B.Sc. Semester-2nd(chemistry)Practical-(B)

duration _4hrs

Max Marks-10*40. Min marks 4*+16

Ex: 1 separation and identification of six radical (3 cation and 3 anion) in the given inorganic mixture. (10)

Acidic radical: CH3COO-,Br-,I-

Basic radical:NH4+,Sr+2,cu+2

Ex2 Synthesis of 3,5- dinitro benzoic acid using benzoic acid and nitrating reagent

Ex.3. To Determine the specific Reaction Rate of the Hydrolysis of methyl Acetate/ethyl acetate Catalyzed by Hydrogen ion's at room temperatur (10)

Ex4viva-voice. (5)

Ex5 Record. (5)

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Chemistry practical Exam

B.Sc. Semester-2nd (chemistry)Practical-(C)

duration _4hrs

Max Marks-10*40. Min marks 4*+16

Ex 1 separation and identification of six radical (3 cation and 3 anion) in the given inorganic mixture. (10)

Acidic radical: CH3COO–, SO-3,Cl-

Basic radical:NH4+,CU+2,Al+3

Ex2. Synthesis of semi carbazones of any one of the following compounds: acetone, ethyl methyl ketone, cyclohexanone, benzaldehyde.

Or

Synthesis of Coumarin through salicylaldehyde.

Ex3 To Compare the Strength of HCl and H2SO4 by Studying the kinetics oSynthesis of semi carbazones of any one of the following compounds: acetone, ethyl methyl ketone, cyclohexanone, benzaldehyde.

Ex5 viva-voice. (5)

Ex6. Record. (5)

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Experiment - 1.

Object : Identify for three acidic (anions) and basic (cations) Radicals.

Material Required : Test tube holder, burner, Test tube, filter paper, etc.

Test for acidic Radicals :

S. No.	Experiment	Observation	Inference
1.	Action of dil. H_2SO_4 mix + dil. H_2SO_4 + Δ Na_2CO_3 + HCl + fresh $FeSO_4$	light brown gas evolved black colour appear	NO_2 may be. NO_2^- confirm
2.	Action of conc. H_2SO_4 mix + con. H_2SO_4	colourless gas evolved with pungent odour.	Cl^- may be
	Na_2CO_3 + dil. HNO_3 + $AgNO_3$	white PPt obtained which dissolve in NH_4OH	Cl^- confirm.
3.	Mix. + con. H_2SO_4 + Δ	light brown flame evolved	NO_3^- may be
	Removation of nitrite: Na_2CO_3 extract + dil. H_2SO_4 + NH_4Cl + Δ	N_2 is evolved completely	Nitrite is removed

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Ring test - above solution + fresh $FeSO_4 + H_2SO_4$	Brown ring is formed at two liquids	NO_3^- confirm

Test for Basic Radicals

S.No.	Experiment	Observation	Inference
1.	Add conc. H_2SO_4 + boil + NH_4Cl Sol^n + O.S + NH_4OH + dil. HNO_3 + heat.	white gelatinous ppt. is obtained.	Al^{+3} may be
	Residue + dil. HCl then add excess NaOH	white ppt. obtained ppt is disappear	Al^{+3} confirm
2.	Filterate of IIIrd group + NH_4Cl + NH_4OH.	white ppt. obtained	Zn^{+2} may be
	H_2S gas + Residue + dil. HCl + NaOH + CH_3COOH + $K_4[Fe(CN)_6]$.	white ppt. obtained	Zn^{+2} confirm
3.	Filterate of IVth group + boil + cool + NH_4OH + $(NH_4)_2CO_3$	H_2S is removed white ppt is obtained	Ba^{+2}, Sr^{+2}, Ca^{+2} may be

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	White ppt. + CH_3COOH		
1.	above Sol.^{n} + $K_2C_2O_4$	No ppt	Ba^{+2} absent
2.	above Sol.^{n} + $(NH_4)_2SO_4$	No ppt. obtained	Sr^{+2} absent
3.	above Sol.^{n} + $(NH_4)_2C_2O_4$	White ppt	Ca^{+2} confirm

Result :-

Acidic :→ NO_2^{-2}, NO_3^-, Cl^-

Basic :→ Al^{+3}, Zn^{+2}, Ca^{+2}
are present in given mixture.

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Experiment-2.

Object :→ Identify three acidic (anions) and basic (cations) radicals.

Material Required :→ Test tube, burner, holder, filter paper, etc.

Test for acid Radicals :

S.No.	Experiment	Observation	Inference
1.	Action of dil. H_2SO_4 mix. + dil. H_2SO_4 + heat	CO_2 gas evolved Colourless gas evolved.	CO_3^{+2} may be SO_3^{-2} may be
	Combination test for CO_3^{-2}, SO_3^{-2} + mix. + $K_2Cr_2O_7$ + dil. H_2SO_4 then gas pass in water	Orange solution CO_2 turns it in milky indicator	SO_3^{-2} is confirm CO_3^{-2} is confirm
2.	Action of conc. H_2SO_4 mix. + conc. H_2SO_4 + heat.	light brown gas evolved	NO_3^- may be
	Aq. sol^n of mix. + fresh $FeSO_4$ + conc. H_2SO_4	Brown ring is formed at function of two liquid.	NO_3^- confirm.

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Test for Basic Radicals :

	Experiment	Observation	Inference
1.	Wet Test :-		
	mix. + NaOH + Δ	Ammonia gas	NH_4^+ may be
	On taking a glass rod wetted with conc. HCl to the mouth of test tube	white furness are formed	NH_4^+ confirm
2.	dil. HNO_3 + Δ + Solid NH_4Cl + Δ + NH_4OH	Green ppt is obtained	Cr^{+3} may be
	Residue + Br_2 + water + NaOH + Δ + CH_3COOH + led acetate + NaOH	Yellow ppt which dissolve ppt.	Cr^{+3} confirm
3.	filterate of III rd group + NH_4OH + $Na\,HPO_4$.	white ppt. is obtained.	Mg^{+2}
	Residue + HCl + NaOH + little yellow + reagent + heat.	Pink ppt. is obtained	Mg^{+2} confirm

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Result :- The three acidic & basic radicals.

Acidic :- SO_3^{-2}, CO_3^{-2}, NO_3^-

Basic :- NH_4^+, Cr^{+3}, Mg^{+2}
are present in the given compound.

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Experiment - 3

Object : Identify three acidic (anions) and three basic (cations) radicals in the given inorganic mixture.

Material Required :- Test tube, holder, burners, filter paper.

Test for acidic Radicals :-

S.No.	Experiment	Observation	Inference
1.	Action of dil. H_2SO_4 + mix. + dil. H_2SO_4 + Δ	Colourless gas with smell of burning sulphur.	SO_3^{-2} may be
	On keeping wetted filter paper with dil. H_2SO_4 and $K_2Cr_2O_7$.	turns filter paper in green	SO_3^{-2} confirm
2.	Action of con. H_2SO_4 mix. + Con. H_2SO_4 mix. + Sodium extract.	Violet gas evolved	I^- may be
	dil. HNO_3 + acidic + $AgNO_3$ + NH_4OH	yellow ppt. obtained	I^- confirm

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3.	mix. + con. H_2SO_4 combination test :-	Insoluble pungent gas	Cl^- may be
	mix. + $K_2Cr_2O_7$ + con. H_2SO_4 + $\Delta \rightarrow$ gas pass in NaOH sol^n + CH_3COOH + $(CH_3COO)_2Pb$	yellow coloured ppt is obtained	Cl^- confirm

Test for Basic Radicals :-

S.No.	Experiment	Observation	Inference
1.	Add dil. HCl + filter + add con. HCl + NH$_4$OH + Oxalic acid + Pass H_2S gas.	ppt is obtained soluble in dil. HCl	Sb^{+3}, Sn^{+2} maybe
		orange ppt obtained	Sb^{+3} confirm
2.	Nitrate of IInd group + Δ + con. H_2SO_4 + NH_4Cl + NH_4OH + Pass H_2S gas.	white ppt is obtained	Zn^{+2} may be
	Residue + dil. HCl + NaOH + CH_3COOH + $K_4[Fe(CN)_6]$	white ppt obtained	Zn^{+2} confirm

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3.	filterate of IV group + boil + cool + NH_4OH + $(NH_4)_2CO_3$ white ppt + CH_3COOH + divide in 3 parts.	H_2S gas removed	Ba^{+2}, Sr^{+2}, Ca^{+2} may be.
		Yellow ppt obtained	Ba^{+2} confirm

Result :- The three acidic radicals SO_3^{-2}, I^-, Cl^- & basic radicals Sb^{+3}, Zn^{+2}, Ba^{+2} are present in the given inorganic mixture.

Experiment - 4.

Object :- Identify acidic (anions) & basic (cations) radicals in given organic mix.

Material Required :- Test tube, holder, burner, filter papers, etc.

Test for acidic Radicals :-

S.No.	Experiment	observation	Inference
1.	Action of dil. H_2SO_4 mix. + dil. H_2SO_4.	Vinegar like odour	CH_3COO^- may be.
	Sodium carbonate ex. + H_2SO_4 + diphenyl ammonia solution.	deep blue colour appear	CH_3COO^- confirm.
	Action of conc. H_2SO_4 mix. + conc. H_2SO_4	colourless gas	$C_2O_4^{-2}$ may be
-	Sodium carbonate extract + dil. CH_3COOH	white ppt obtained	$C_2O_4^{-2}$ confirm
	Test for basic Radicals		
1.	Add HNO_3 + Δ + dil. H_2SO_4 + C_2H_5OH + NH_4OH	No ppt. is obtained	Cu^{+2} may be.
	CH_3COOH + $K_4[Fe(CN)_6]$	Chocolatey coloured ppt	Cu^{+2} confirm

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2.	Add dil. HCl	Soluble	Mn^{+2}, Zn^{+2} may be.
	Residue + dil. HNO_3 + PbO_2 + cool	Violet colour solution appear	Mn^{+2} confirm.
3.	Filterate of IV grap + Δ + cool + NH_4OH + $(NH_4)_2CO_3$	H_2S gas is removed white ppt. is obtained	Ba^{+}, Sr^{+}, Ca^{+2} may be.
→	Residue + CH_3COOH above sol^n + K_2CrO_4	No. ppt obtain	Ba^{+2} absent.
→	above sol^n $(NH_4)_2SO_4$	No ppt obtain	Ba^{+2} absent, Sr^{+2} confirm.

Result :- Acidic radicals CH_3COO^-, $C_2O_4^{-2}$ and Basic radicals - Cu^{+2}, Mn^{+2}, Sr^{+2} are present in the given inorganic mixture.

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Experiment – 5

Object : Identification of functional group in given organic compound and also also observe element test.

Primary test :-

State - solid

Colour - light Brown

Odour - Phenolic

Solubility - Water soluble

S.No.	Experiment	Observation	Inference
1.	Flame test: Take a carbonic comp. on spatula & burn it with help of Burner.	It gives black fumes.	Aromatic compound
2.	Litmus Test: Take a blue litmus Paper into carbonic compound sol^{n}.	paper turns blue litmus to red	Acidic in nature
3.	Nitrogen Test : Carbonic compound +fresh sol^{n} of $FeSO_4$ + Conc. H_2SO_4	green ppt. absent	N - absent

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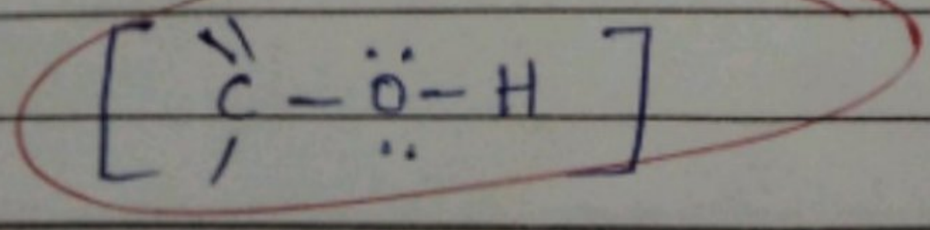
4.	Fuctional group detection		
(i)	Sodium metal Test: Take about 1ml of the given liquid in a dry test tube. add about 1gm of anhydrous. Calcium sulphate & shake well to remove water. filter the liquid into another clean test tube & add a small piece of Na metal.	Brisk afferescence is produced.	evolution of H_2 gas indicate presence of -OH group.
(ii)	Ceric ammonium nitrate Test :- Take about 1 ml of the given liquid in a clean dry test tube & add few drops of ceric ammonium nitrate reagent & shake it well.	Pink or red colour is developed	Phenol group present.

Result :- In given C compound the [-C(=O)-OH] phenol functional group is present.



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Experiment - 6.

Object :- Identification of functional group in given organic compound & observe element test.

Primary Test :-

state - solid

Colour - Colourless

Odour - odourless

Solubility - soluble in water

S.No.	Experiment	observation	Inference
1.	Flame Test :- Take a carbonic compound on spetulla & burn it with the help of burner.	Gives white fumes	Aliphatic compound.
2	Litmus Test : Take a blue litmus/Red paper into carbon compound solution	turns blue litmus into red	Acidic in nature presence of COOH group.
3.	Nitrogen Test : Carbonic compound + fresh $FeSO_4$ soln + conc. H_2SO_4	blue & green ppt. absent	N- absent

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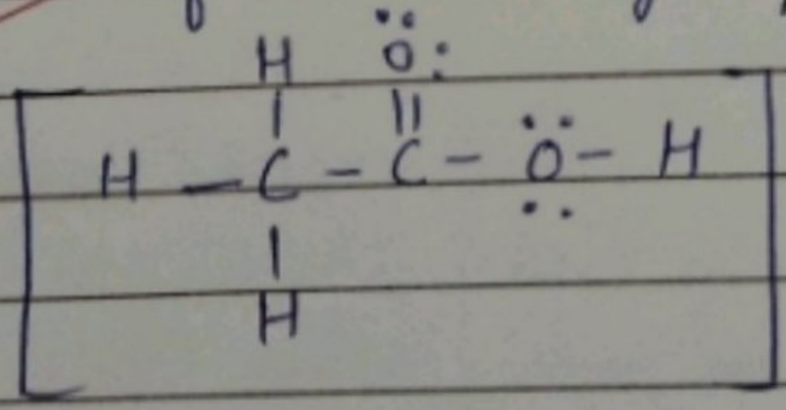
4	Functional group detection :-		
(i)	Sodium hydrogen Carbonate test :- Add a pinch of Sodium bicarbonate in given organic comp.	Brisk efferesence is observed	Presence of -COOH group.
(ii)	Ester Test :- Add 1 ml of ethyl alcohol & 1-2 drops of conc. H_2SO_4 in given organic Compound. heat the mixture on a water both. & them mix. into a beaker containing water.	gives fruity smell	presence of -COOH group.

Result :- In the given compound the -COOH functional group is present.



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Experiment - 7

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object :- Identification of functional group in given organic compound & also observe element test.

Primary Test :-

State - Solid

Colour - light yellow

Odour - Bitter almond like

Solubility - insoluble in water.

S.No.	Experiment	observation	Inference.
1.	Flame Test :- Take a carbon comp. on spetulla & burn it with help of burner.	Gives white fumes	Aliphatic compound.
2.	Litmus Test :- Take a blue litmus paper into the carbon compound solution	litmus paper remain unchanged	Nutral.
3.	Nitrogen Test :- Carbon compound + fresh $FeSO_4$ + Conc. H_2SO_4	blue or green ppt obtained	N- present

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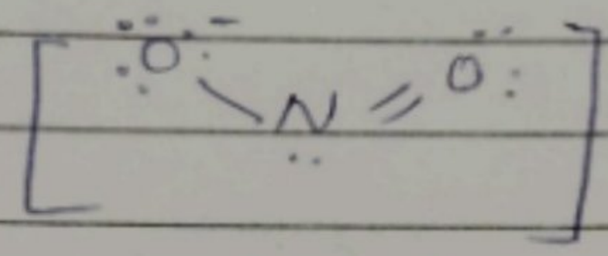
4.	Functional group:-		
(ii)	Carbon compound + NH_4Cl_3 sol^n + C_2H_5OH + Zn + filter paper + Tollen reagent	Gives brown coloured solution	NO_2 present

Result :- In the given comp. carbonic compound NO_2^- [nitrite] is present.



Experiment - 8

Object :- Identification of functional group in given organic compound & also observe element test.

Primary Test :-

State - Solid

Colour - Colourless

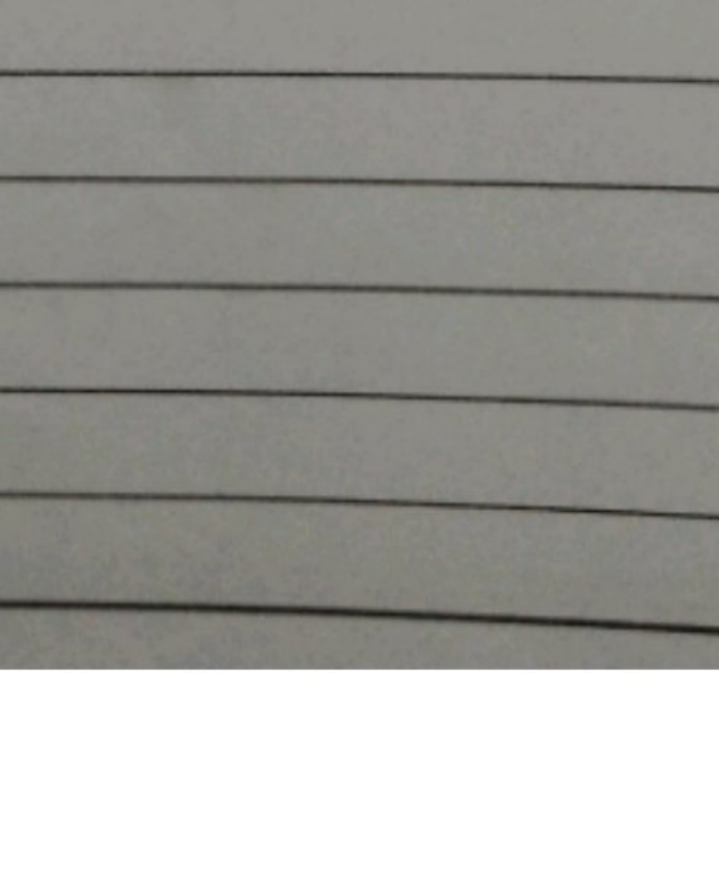
Odour - like Nail paint

Solubility - Water soluble

S.No.	Experiment	observation	Inference
1.	Flame Test : Take a carbon comp. on spetulla & burn it help of burner	gives white fumes	Aliphatic compound
2.	Litmus Test : Take a litmus paper into a carbon comp. solution	No change in litmus paper.	Neutral
3.	Nitrogen Test : Carbon comp. + fresh sol^{n} of $FeSO_4$ + conc. H_2SO_4	blue & green ppt. absent	N - absent

4.	Functional Group:		
ii	Molish's Test :- 10%	Two layer are	
	alcholic solution	formed, At the	Carbohydrate
	of α-naphthanol	junction of two layer	present
	+ water soln +	a red liquid is formed	
	Molish's reagent	which turns into	
	+ conc. H_2SO_4	radish - violet colour	

Result :- In given, carbon compound carbohydrate $[(CH_2O)_n]$ is present



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Experiment - 9

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Object :- Identification of function group in organic compound & also observe element Test.

Primary Test :-

State - solid

Colour - Light Yellow

Odour - Pungent smell

Solubility - Insoluble

S.No.	Experiment	Observation	Inference
1.	Flame Test :- Take a carbon comp. on Spatulla & burn it help of burner	Gives black fumes	Aromatic Compound
2.	Litmus Test :- Take litmus paper into Carbon compound solution	No change in litmus paper.	Neutral
3.	Nitrogen Test :- Carbon Compound + fresh $FeSO_4$ + conc. H_2SO_4.	Blue or green ppt absent	N- & absent

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4.	Fuctional group :-		
(i)	2,4-Dinitrophenyl hydrazine. Test :- Carbonil comp. + 2,4-Di phenyl hydrazine	Yellow-orange ppt formed	presence of Carbonyl group
(ii)	Sodium nitroprusside Test :- given compound + sodium+nitroprusside +distilled water+ shake it + NaOH solution.	Red Colouration	Ketonic group is present

Result :- In given carbon compound the ketone group $\left[R-\overset{\overset{:O:}{\|}}{C}-R \right]$ is present

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Experiment - 10

DATE .....

object :- Identification of functional group in given organic compound & also known observe element test.

Primary Test :-

State - Solid

Odour - Sweet smell

Colour - white

Solubility - Water soluble

S.No.	Experiment	Observation	Inference
1.	Flame Test : Take a Organic Comp. on spatulla & burn it with help of burner	gives white fumes	Aliphatic compound
2.	Litmus Test :- Take a Litmus paper into the carbon compound solution.	No change	Neutral
3.	Nitrogen Test :- Carbon comp. + fresh soln of $FeSO_4$ + conc. H_2SO_4	Litmus do not change	N_2 absent

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4.	Functional group :		
(i)	2,4-dinitrophenyl hydrogen Test :- organic comp. + 2,4-dinitrophenyl hydrazine	Yellow-orange ppt formed	Carbonyl group present.
(ii)	Fehling's Test :- Fehling sol^{n} A + B + given organic compound + heat	Red ppt formed	aldehyde present.

Result :- In given organic compound the aldehyde group $\left[-\underset{\underset{H}{|}}{C}=O:\right]$ present

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Experiment - 11

object :- Identification of functional group in given organic comp. & also observe element test.

Primary Test :-

State - Solid

Colour - white

Odour - odourless

solubility - Insoluble

S.No.	Experiment	observation	Inference.
1.	Flame Test : Take a organic comp. & burn it with help of burner	Black fumes	Aromatic Compound.
2.	Litmus Test : Take a Red litmus paper into carbon comp. soln	turns Red to blue	Basic
3.	Nitrogen Test : Organic compound + fresh $FeSO_4$ + conc. H_2SO_4	Gives blue colour ppt.	Nitrogen present.

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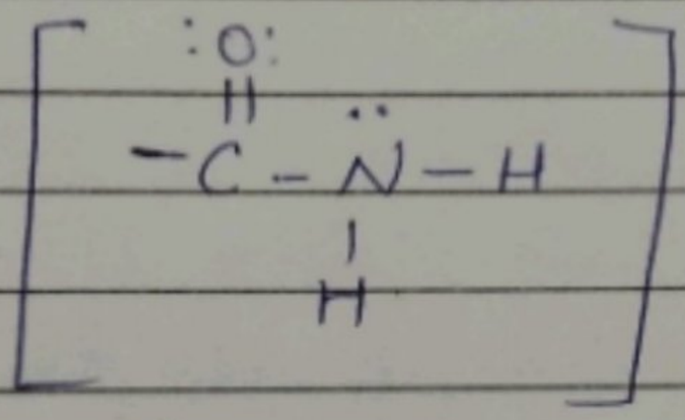
4.	Functional Group test		
(i)	Organic Compound + NaOH soln + heat	Small like ammonia	$-CONH_2$ may be
(ii)	Organic comp. + dil. HCl + $NaNO_2$	N_2 gas liberate	$-CONH_2$ is Present

Result :- In given organic compound - [$CONH_2$] Amido group is present.



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Experiment - 12

object :- Identification of functional group in the given compound & also obsesive element test.

Primary Test :-

State :- Solid

Colour :- colourless

Odour :- spirit like

Solubility :- soluble

S.No.	Experiment	Observation	Inference
1.	Flame Test : Take a organic compound on spetulla & burn it help of burner	Gives white fumes	Aliphatic compound
2.	Litmus Test : Take a litmus paper into the carbon comp. solution.	No change in litmus paper	Neutral
3.	Nitrogen Test :- Organic compound + fresh $FeSO_4$ + Conc. H_2SO_4	No ppt is formed	$N\bar{z}$ absent

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4.	Functional group:		
(i)	Organic comp + Na	H_2 gas liberate	-OH group may be
(ii)	Organic comp. + ferric Ammonium Nitrate Sol^n	Gives Red coloured solution	-OH group confirm

Result :- In given organic compound -OH (Alcholic) group is present.

$$[R-\ddot{\underset{\cdot\cdot}{O}}-H]$$

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Experiment :- 13

DATE .....

object :- Identification of functional group in given organic comp. & also observe element test.

Primary Test :-

State - solid

Colour - Red Brown

Odour - Raw fish like

Solubility - Insoluble

S.No.	Experiment	Observation	Inference
1.	Flame Test : Take a organic compound and burn with help of burner.	gives black fumes	Aromatic compound
2.	Litmus Test :- Take a litmus paper into carbon compound solution.	turns Red to blue	Basic
3.	Nitrogen Test : Organic comp. + fresh sol^{n} of $FeSO_4$ + Conc. H_2SO_4	Blue coloured ppt.	N- present

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4.	Function group test		
(i)	Carbonyl amine iso-cyanide test :- Carben comp + $CHCl_3$ + CH_3Cl + NaOH + Δ	Unpleasant / harsh smell	Amino group is present

Result :- In given organic compound [$-\ddot{N}H_2$] Amino group is present.

$$-\ddot{N}H_2$$

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Experiment - 14

DATE .....

Object :- Identification of functional group in the given organic comp. & also observe element test.

Primary Test :-

state - solid

Colour - Colourless

Odour - Fruity smell

Solubility - Soluble

S.No.	Experiment	Observation	Inference
1.	Flame Test: Take a organic comp. on & burn it with help of burner.	Gives white fumes	Aliphatic Compound
2.	Litmus Test: Take on Red or blue litmus paper into carbon comp. solution.	turns blue litmus to Red	Acidic
3.	Nitrogen Test : Organic comp. + fresh soln of $FeSO_4$ + conc. H_2SO_4	solution do not give yellow colour.	N - absent

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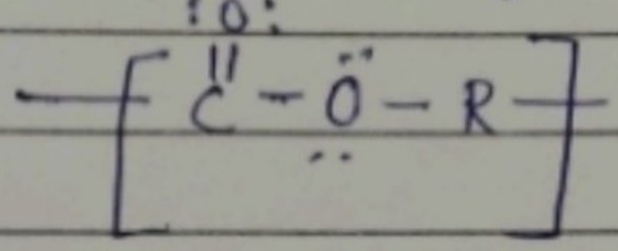
4.	Functional group:		
ii)	Hydroxyl amine hydrochloride + methanol & 2N-KOH sol^{n} methol + NH2OH-HCl + KOH Sol^{n} + Δ + dil-HCl + cool + $FeCl_3$	Redish-Violet colour appear	ester group is present.

Result : In the given organic compound the -[COOR]. Ester group is present.



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Object :- Find out viscosity of given liquid with help of viscometer.

Apparatus :- Ostwald viscometer, relative viscosity bottle, beaker, etc.

Principle :- $\frac{x_1}{x_2} = \frac{t_1 d_1}{t_2 d_2}$

x_1 = viscosity coef water.
x_2 = Viscosity of sol^n
t_1 = Time of water flows.
t_2 = Time of sol^n flows.
d_1 = density of water.
d_2 = density of sol^n

Chemical Required :- water solution

Observation - 1.

(i) Room temp. = 27°C
(ii) Viscosity of H_2O = 0.1
(iii) desity of H_2O = 0.1 gm/mol
(iv) desity of liquid = 1.005 gm/mol

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Observation - II

(i) Viscosity of water = 0.01 poise
(ii) density of water (d_1) = 100 gm/mol
(iii) density of sol^n (d_2) = 1.01 gm/cm
(iv) Like taken in sol^n = 80 sec

Calculation :-

1. $$x_2 = \frac{t_2 d_2 \times x_1}{t_1 d_1}$$

$t_2 = 80$ sec $\quad t_1 = 70$ sec
$d_2 = 1.005$ gm/m^3 $\quad d_1 = 10$ gm

$x_1 = 0.01$

But t_1, d_2, $t_1 d_1 x_1$ value = inc ↑

$$x_2 = \frac{t_2 d_2 \times x_1}{t_1 d_1}$$

$$x_2 = \frac{80 \times 1.005 \times 0.01}{70 \times 1.0} = 0.11487 5 \text{ poise}$$

2. $$x_2 = \frac{t_2 d_2 \times x_1}{t_1 d_1}$$

$t_2 = 85$ sec
$d_2 = 1.01$ gm/cm^2, $t_1 = 70$ sec
$d_1 = 1.0$ gm/cm^2
$x_1 = 0.01$ +

$$x_2 = \frac{85 \times 1.01 \times 0.01}{70 \times 1.0} = 0.012 2642 \text{ poise}$$

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③ Calculation:- $x_2 = \frac{t_2 d_2 x x_1}{t_1 d_1}$

$t_2 = 90 sec$
$d_2 = 1.015\ gm/cm^3$
$t_1 = 70 sec$
$d_1 = 1.0 gm/cm^3$
$x_1 = 0.01\ g\ poise$

$$x_2 = \frac{90 \times 1.015 \times 0.1}{70 \times 1.0} = 0.01365$$

Observation :- Viscosity of soln (x_2) = 0.01365 poise

④ Calculation :- $t_2 = 90 sec$
$d_2 = 1.080\ gm/cm^3$
$t_1 = 70 sec$
$d_1 = 1.0 gm/cm^3$
$x_1 = 0.01$

$$x_2 = \frac{90 \times 1.020 \times 0.01}{70 \times 1.0}$$

$= 0.13114$ poise

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Observation table - I.

Time taken by water flow (t_1)	Time taken by solution flow (t_2)
70 sec	80 sec
75 sec	80 sec
65 sec	75 sec
t_1 = 70 sec	t_2 = 80 sec

Observation :- Viscosity of soln = 0.114875 poise.

Observation Table. - II

Time taken by waterflow (t_1)	Time taken by soln flow (t_2)
70 sec	90 sec
75 sec	80 sec
65 sec	80 sec
t_1 = 70 sec	t_2 = 80 sec

observation :- viscosity of soln = 0.0122642

Observation Table. - III

Time taken by waterflow (t_1)	Time taken by soln flow (t_2)
70 sec	90 sec
75 sec	85 sec
65 sec	95 sec
t_1 = 70 sec	t_2 sec

observation :- viscosity of soln = 0.01365

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⑤ Calculation V

$$x_2 = \frac{t_2 d_2 x_1}{d_2 t_1}$$

$t_2 = 100$ sec
$d_2 = 1.025$ gm/cm³
$t_1 = 70$ sec
$d_1 = 1.0$ gm/cm3
$x_1 = 0.01$

$$x_2 = \frac{100 \times 1.025 \times 0.01}{7.0 \times 1.0}$$

$= 0.01464$ Poise

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observation Table IV th

Time taken by water flow (t_1)	Time taken by soln flow (t_2)
70 sec	85 sec
75 sec	90 sec
65 sec	96 sec
t_1 = 70 sec	t_2 = 90 sec

observation :- Virosity of soln (x_2) = 0.13114 Poise

Observation Table - V

Time taken by water flow (t_1)	Time taken by soln flow (t_2)
70 sec	95 sec
70 sec	105 sec
65 sec	100 sec
t_1 = 70 sec	t_2 = 100 sec

Observation :- Viscosity of solution (x_2) = 0.01464 poise

Result :- Viscosity of soln at 27°C = 0.01464 poise

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PAGE NO. 36 Experiment-16 DATE

object :- To determine surface tension of given organic liquid by stalagmometer.

Apparatus & Chemical Required :- Stalagnometer, beaker, H_2O, organic liquid, etc.

Principle :-

$$V_2 = \frac{n_1}{n_2} \cdot \frac{d_2}{d_1} \cdot V_1 \quad \text{---} (1)$$

V_2 = surface tension of organic liquid
V_1 = Surface tension of H_2O = 71.16 dyne/cm
d_2 = density of liquid = 0.78 g/ml
d_1 = Density of H_2O = 1.0 g/ml
n_2 = no. of drops of liquid
n_1 = no. of drops of H_2O

Observation :-

Room temp. - 30° C
density of water - 1 gm/cm^3
Surface tension of H_2O - 71.8
density of liquid - 1.5

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Calculation I :-

$$V_2 = \frac{d_2 n_1 V_1}{d_1 n_2}$$

$d_2 = 1.5$ gm/cm^3

$d_1 = 1$ gm/cm^3

$n_1 = 63$

$n_2 = 105$

$$V_2 = \frac{1.5}{1} \times \frac{63}{105} \times 7.8$$

$V_2 = 64.6200$ dyne / cm.

Calculation - II

$$V_2 = \frac{d_2}{d_1} \cdot \frac{n_1}{n_2} \cdot V_1$$

$d_2 = 1.063$ gm/cm^3

$d_1 = 1$ gm/cm^3

$n_1 = 63$

$n_2 = 72$

$V_1 = 71.8$

$$V_2 = \frac{1.063}{1} \times \frac{63}{72} \times 71.8$$

$V_2 = 66.7829$ dyne/cm.

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Observation Table - I :-

no. of drops of water (n_1)	no. of drops of liquid (n_2)
60	105
64	113
65	102
63	100
$n_1 = 63$	$n_2 = 105$

observation :- surface tension of liquid = 64.6200 dyne/cm

Observation Table. II :-

no. of drops of water (n_1)	no. of drops of liquid (n_2)
60	72
64	72
65	65
63	78
$n_1 = 63$	$n_2 = 72$

observation :- surface tension of liquid = 66.7829 dyne / cm.

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Calculation - III

$$V_2 = \frac{d_2}{d_1} \cdot \frac{n_1}{n_2} \cdot V_1$$

$d_2 = 1.075 \text{ gm/cm}^2$

$d_1 = 1.0 \text{ gm/cm}^2$

$n_2 = 72$

$n_1 = 63$

$V_1 = 71.8$ Dyne/cm

$$V_2 = \frac{1.075}{1} \times \frac{63}{72} \times 71.8$$

$V_2 = 67.536$ dyne/cm.

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observation Table. III

no. of drops of water (n_1)	no. of drops of liquid (n_2)
64	70
64	71
65	73
63	74
$n_1 = 63$	$n_2 = 72$

Result :- Surface tension of liquid = 67.5368 dyne/cm

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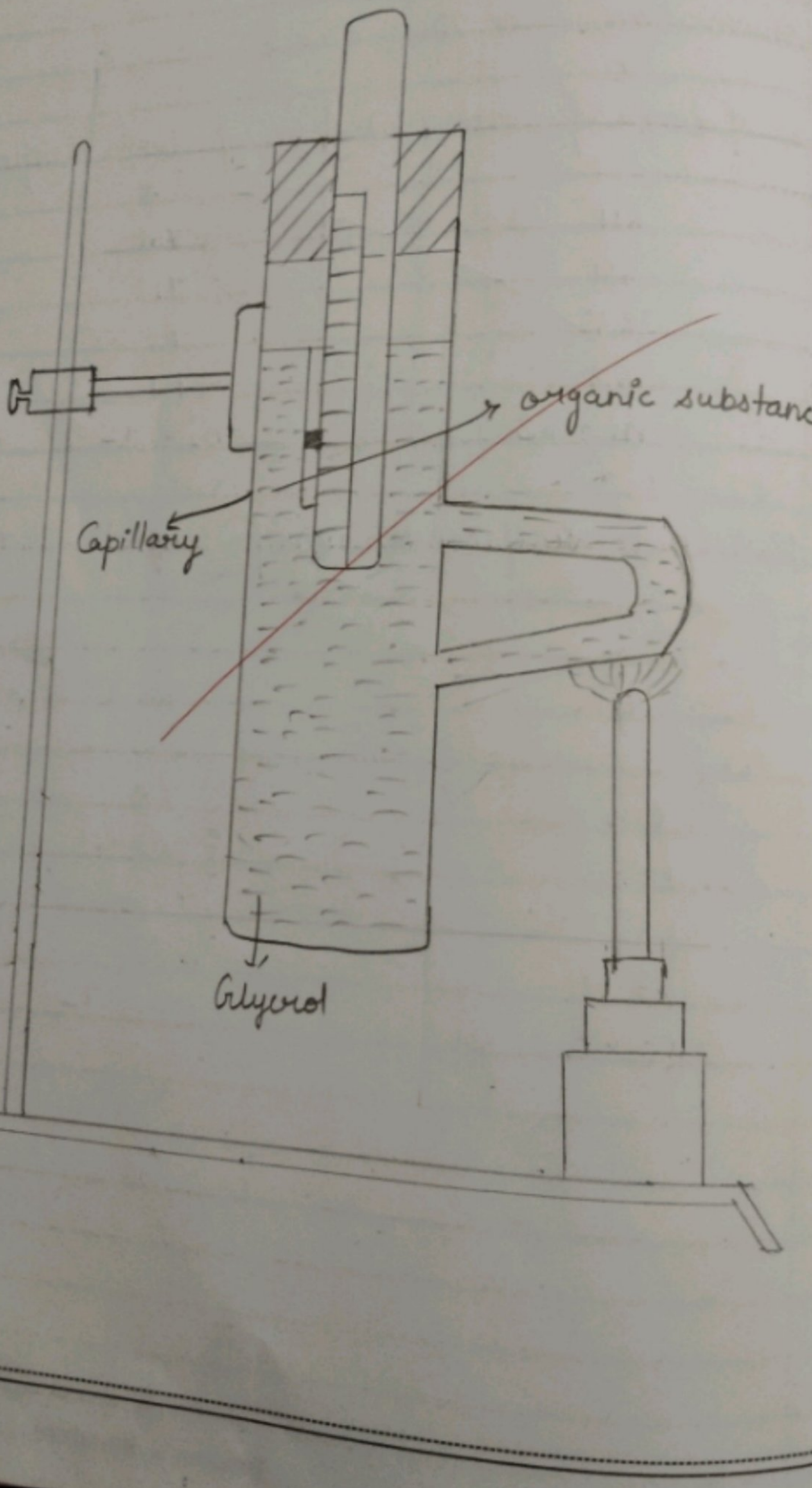

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Experiment - 17

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object :- To determine melting point of organic is solid

Apparatus & Chemical Required :- Urea, Thermometer, Rubber, Capillary tube, stand, glycerol, etc.

Method :-

(1) Three tube filled 2/3 with glycerol.

(2) The one end of tube seal by heating in the flame of burner & filled 2/3 with urea.

(3) The capillary tube binds with lower end of thermometer by rubber band & it adjusted in tube in such a manner that the bulb of thermometer & half of tube dipped in glycerol.

(4) Now heat the tube gently after some time the solid comp. just start to melt the temp. from thermometer noted at which subs. start to melt.

(5) It is melting point of solid.

Result :- 132.6°C melting point of urea is obtained.

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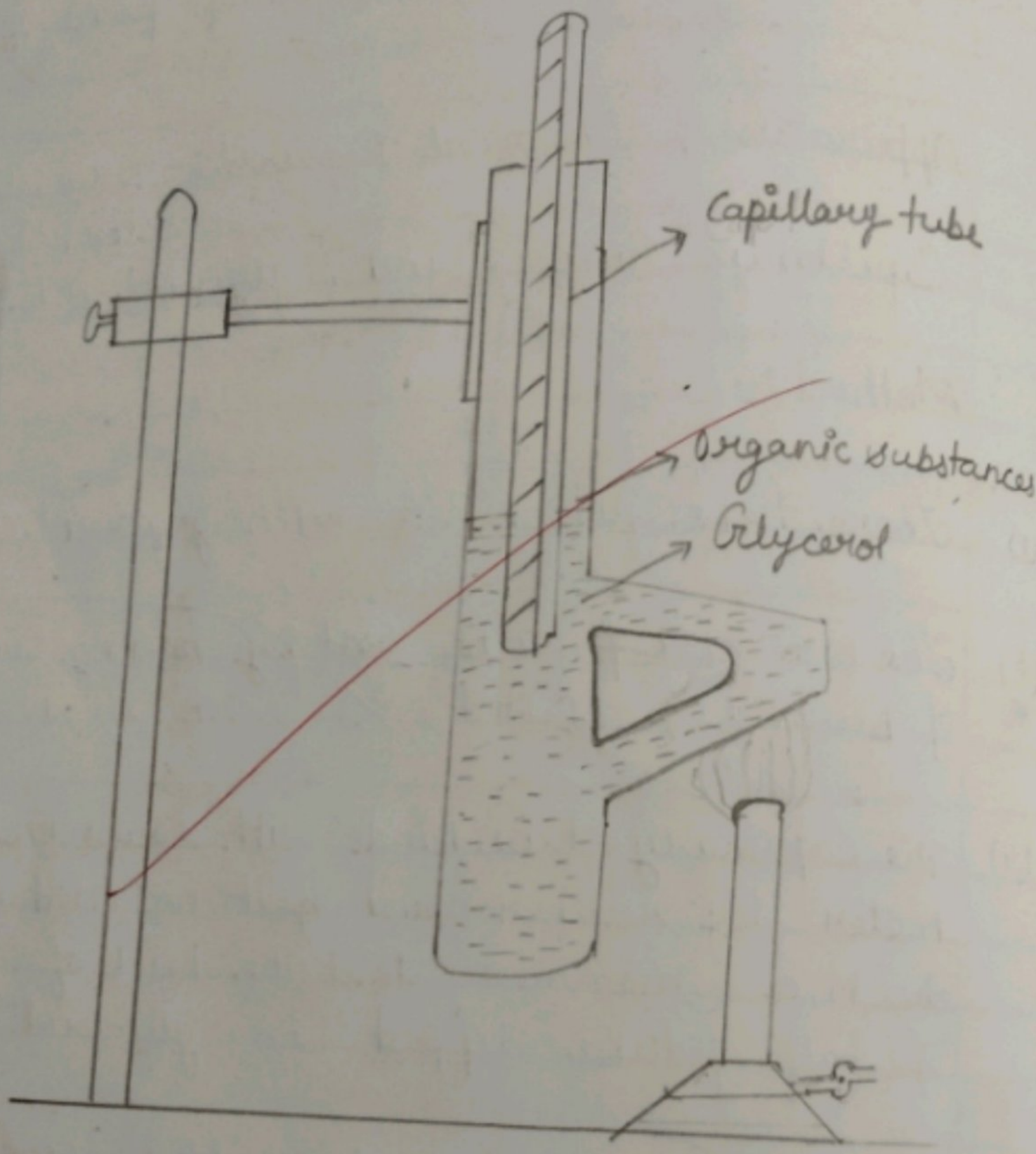

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Experiment - 18

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object :- To determine melting point of organic solid.

Apparatus & Chemical Required :- Napthalene, Thale's tube, thermometer, capillary tube stand, glycerol, etc.

Method :-

(1) Thele's tube filled to 2/3 with glycerol.

(2) The one end of tube seal by heating of in flame of burners fill 2/3 with powder of napthalene.

(3) The capillary tube bands with lower ends of thermometer by rubber bands, it adjusted in thele's tube in such a manner that the bulb of thermometer. Half of Capillary tube dipped in glycerol.

(4) Now heat thele's tube gently. After sometimes the solid compound just start to melt & form theremeter noted at which subs. start to melt.

(5) It is melting point of solid.

Result :- Bo.5°C of melting point of Napthalene is obtained.

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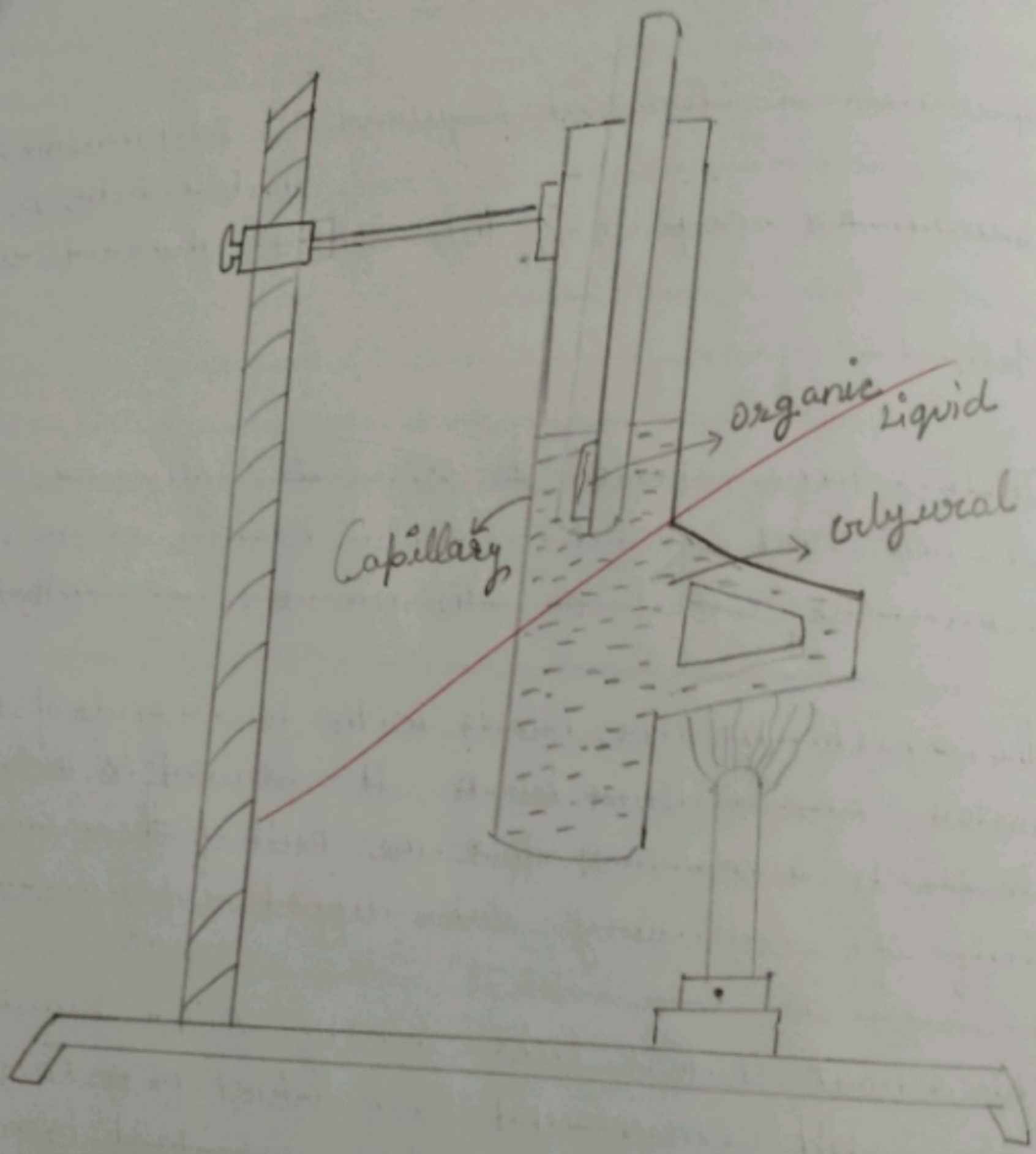

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Experiment - 19

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Object :- To determine the boiling point of organic liquid.

Apparatus & Chemical Required :- Ethanol, thele's tube, thermometer, stand, Glycerol, etc.

Method :- (i) Thele's tube filled 2/3 with glycerol

(ii) The one end of tube seal by heating in the flame of burner & filled 2/3 with ethanol.

(iii) The tube binds with lower ends of thermometer by rubber band & it adjusted in thele's tube, such a manner that that bulb of thermometer & half of capillary disappear from glycerol.

(iv) Now heat the theles tube gently after sometime air bubbles comes out from end of tube the temp. of thermometer noted.

(v) The temp. of thermometer also noted at which bubble stopped from capillary on cooling. The B.P. of liquid is mean of both temp.

Result :- The 78.6 B.P is obtained of ethanol.

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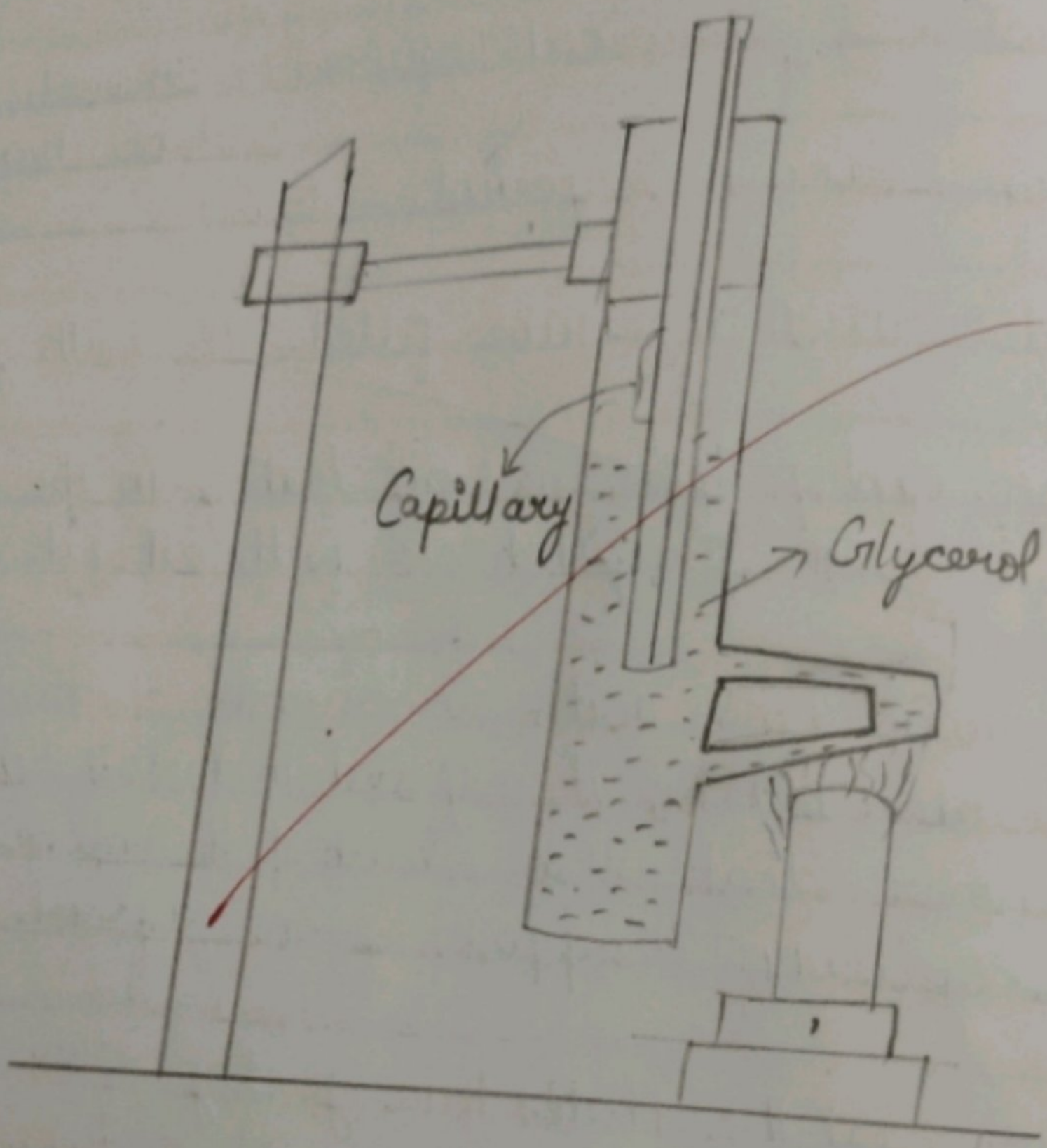

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Experiment - 20

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Object :- To determined B.P of organic liquid.

Apparatus & Chemical Required :- Methanol, thele's tube, capillary stand, glycerol, etc.

Method :-

(i) Thele's tube filled 2/3 with glycerol.
(ii) The one end of capillary tube seal by heating in the frame of burner & fill 2/3 with methanol liquid.
(iii) The capillary tube binds with lower end of thermometer by rubber band and it adjusted in thele's tube in such a manner that the bulb of thermometer & half of cappillary dipped in glycerol.

(iv) Now heat the thele's tube gently, after sometime air bubbles comes out from end of capillary.

(v) The temp. of thermometer also noted at which bubbles stop from capillary in cooling the boiling point of liquid is mean of both temp.

Result :- 65.7°C B.P. is obtained of methanol.

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Experiment - 21

DATE

Object :- To determine crystallisation of given impure organic solid by hot water.

Apparatus & Chemical Required :- Benzoic acid, beaker, tripod stand, funnel, etc.

Method :-

(i) The unique benzoic acid take in beaker & add H_2O in beaker.

(ii) Above sol^n heat till boiling untill the whole substance has disolved.

(iii) filter the boiling solution & remain it to cold.

(iv) After sometime crystal of acid deposited in bottom.

(v) filter the crystal & dryed.

Result :- The colourless crystal of benzoic acid is obtain.

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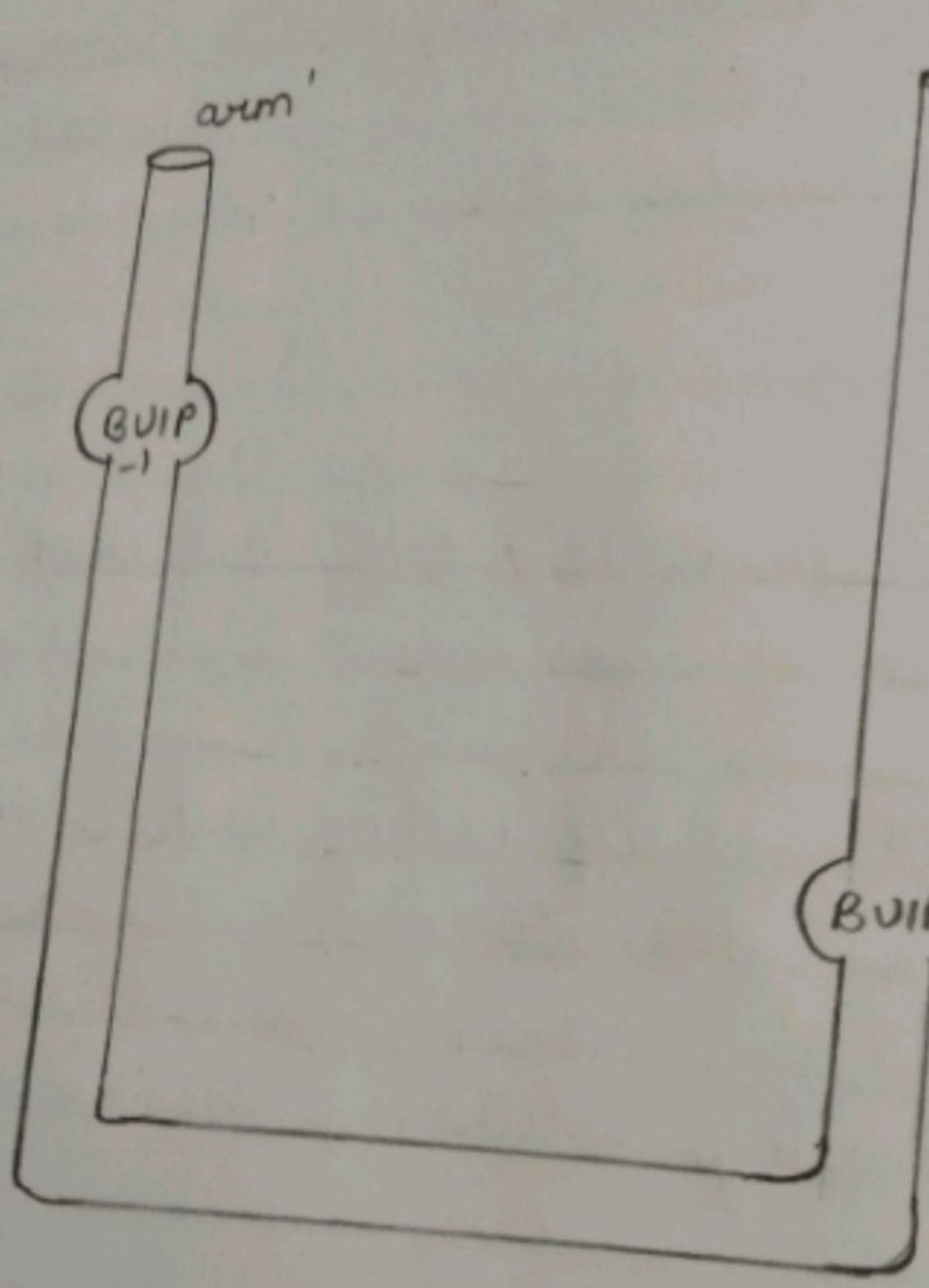

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