R. K. GROUP OF COLLEGE

BEHIND KALWAR POLICE STATION, KALWAR, JAIPUR (RAJ.)

CERTIFICATE

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Teacher in-charge

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Object :-
Seperation and identification of three acidic (anions) and basic (cations) radicals in given inorganic mixture.

Apparatus :-
Beaker, Test tube, holder, Funnel, Burner, filter paper.

Sr. No.	Experiment	observation	Result
	Test for acidic radicals		
1.	Mixture + dil. H_2SO_4	Sharp smell with light brown coloured gas.	Weak group is present.
2.	On taking a filter paper near the mouth of test tube	filter paper turn blue purple	NO_2^- confirmed
3.	Mixture + freshly prepared solution of H_2SO_4	Black brown precipitate is obtained	NO_2^- confirmed.
4.	On heating mixture + CO_2 H_2SO_4	Gas having sharp smell.	Strong group is present may be Cl^-
5.	On putting MnO_2 crystal in test tube and heating it	Yellow coloured gas is evolved.	Cl^- confirmed.

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6.	Mixture + $AgNO_3$ solution	White precipitate	Cl^- confirmed.
7.	Conc. + HNO_3 + mixture + $BaCl_2$ solution.	White ppt is obtained	Normal group can be present
8.	Dividing the above ppt in two parts :-		
(i)	first div. + conc. H_2SO_4	insoluble white ppt.	SO_4^{2-} confirmed.
(ii)	Second div. + conc. HNO_3	insoluble white ppt.	SO_4^{2-} confirmed.
	Test for Basic radicals :-		
9.	Mixture + heating after adding NaOH	Smell of ammonia	may be zero group.
10.	On taking a rod dipped in conc. HCl near the mouth of test tube.	white fumes are formed.	may be NH_4^+
11.	On taking a filter paper dipped in nessler near the mouth of test tube.	filter paper turny Black, red - brown - ed.	NH_4^+ confirm
12.	On taking filter paper dipped in mercuries nitrate near the mouth of test tube.	filter paper turny black	NH_4^+ confirm - ed.

13.	Original Solution of mixture + HCl	No white ppt.	I^{st} group is present
14.	On passing H_2S gas in the ppt obtained by I^{st} group.	Yellow ppt. is obtai -ned.	II^{nd} group is present.
15.	On boiling above ppt. in conc. HNO_3	ppt. remains in -soluble	A group is pres -ent.
16.	On boiling remaining ppt. in conc. HNO_3	Yellow ppt. become -s soluable	Cd^{+2} confirmed.
17.	On passing H_2S gas again in above solution after adding NH_4OH	Yellow ppt is obtained again	Cd^{+2} confirmed.
18.	On boiling filtered obtai -ned from second group.	H_2 gas is evolve -d.	
19.	On taking filter paper dipped in the solution of lead acetate near the mouth of test.	filter paper does not turn out golden black.	Third group is absent.
20.	After adding 2-4 drops of conc. HNO_3 if H_2S less sol. boil it and then add solid NH_4Cl +		

	NH_4OH in excess in the solution.		
21.	On passing H_2S gas in the obtained from third group.		
22.	On boiling obtained from fourth group.	H_2S gas is evolved	
23.	On taking a filter paper dipped in lead accetate near the mouth of testube	filter paper does not turn golden black	H_2S gas is evolved
24.	On adding $(NH_4)_2CO_3$ after adding NH_4OH in a solution without H_2S gas	No white ppt.	Fifth group is present
25.	On adding NO_2HPO_4 in the filtered obtained from fifth group.	white ppt is obtain -ed.	Sixth group Mg^{+2} can be present.
26.	On adding NaOH in the precipitate and them adding.	Red pink ppt is obtained.	Mg^{+2} confirmed.

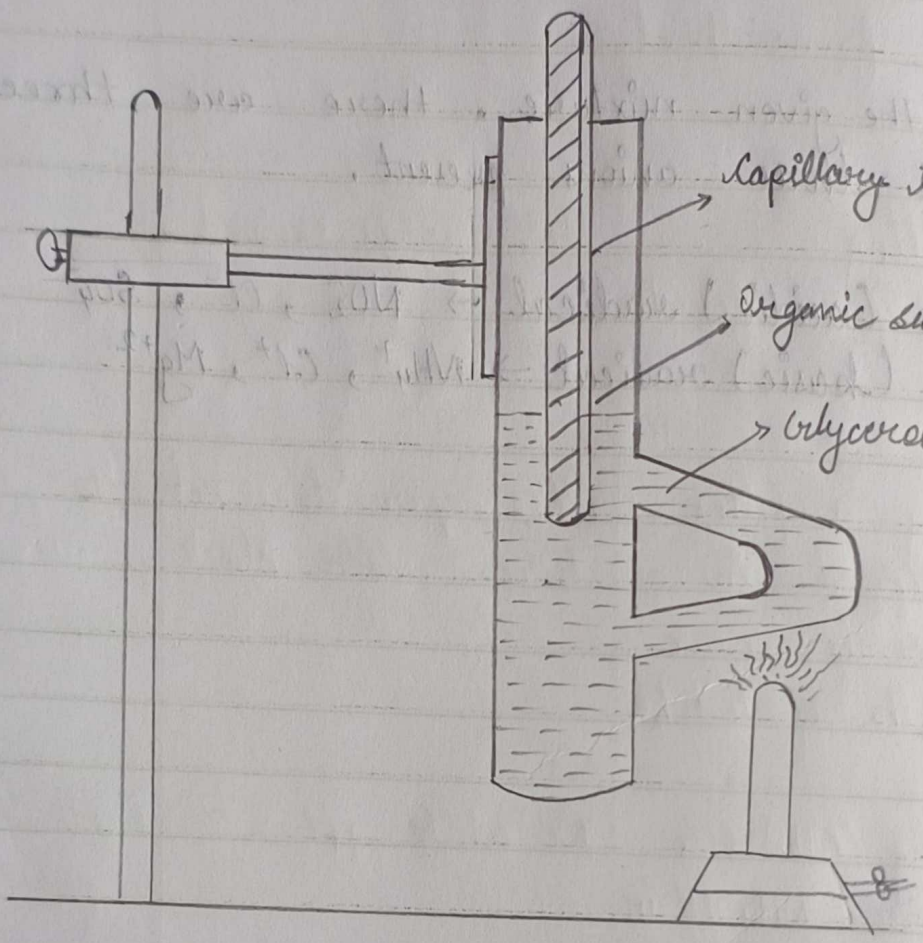
27.	On adding the white ppt obtained from Na_2PHy in cobalt nitrate.	Pink ash is obtained from filter paper	Mg^{+2} confirmed

Result :-

In the given mixture, there are three cations and three anions present.

Anions (acidic) radical → NO_2^-, Cl^-, SO_4^-

Cations (basic) radical → NH_4^+, Cd^+, Mg^{+2}


Capillary tube
Organic substances
Glycerol

Experiment - 2

Object :-

Identify the melting point of given organic compound naphthalene.

Apparatus and chemical Required :-

Napthalane, Thale 's' tube, thermometer, capillary tube stand, glycerol etc.

Method

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

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

(3) The capillary tube bands with lower ends of thermo-meter by rubber bands, it adjusted in thele 's' tube in such a manner that the bulb of theremeter 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) If is melting point of solid.

Result :-

80.5°C of melting point of Napthalene is obtained.

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Experiment - 3

DATE .....

Object :-

Identification of functional group in given organic comp. and 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. and burn it with help of burner.	Black fumes	Aromatic compound.
2.	Litmus test :- Take a red litmus paper into carbon comp. solution	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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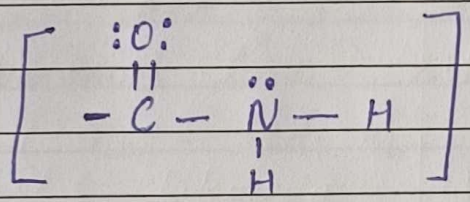
4.	Functional group test		
(i)	Organic compound + NaOH Solution + heat	Smell like ammo -nia	$-CONH_2$ may be
(ii)	Organic compound + dil. HCl + $NaNO_2$	N_2 gas liberate	$-CONH_2$ is present

Result :-

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



Object :-

Calculating the viscosity of given carbonic compound / liquid using Oastwald viscometer.

Apparatus :-

Oastwald viscometer, stopwatch, Beaker.

Principle :-

$$\frac{n_1}{n_2} = \frac{t_1 d_1}{t_2 d_2}$$

Where n_1, t_1, d_1 and n_2, t_2, d_2 are the viscosity defined volume consumed time and density respectively

$$n_2 = \frac{t_2 d_2 n_1}{t_1 d_1}$$

Method :-

1. Viscometer is firstly washed with NaOH, then in chromic acid and them with dist. water, it is soaked in oven.

2. Now this is directly tied in stand.

3. Now the amount of dist. water is filled in viscometer through the end with a wide tube, up to which the viscometer's lower bulb B is filled approximate half.

Calculation :

Calculating expected density.

Weight of empty picometer.

Picometer x weight of water

Picometer + weight of liquid.

Expected density of liquid.

$$n_1 = \frac{d_1 \times t_1}{d_2} \times n_2$$

$d_1 = 1$

$d_2 = 0.79$

$n_1 = 8$

$$n_2 = \frac{d_2 t_2}{d_1 t_1}$$

$$n = \frac{0.79 \times 93}{1 \times 79} \times 8$$

$$= \frac{587.76}{79}$$

$= 7.44$ ml quaine.

4. The water in tube is pulled through a the rubber tube attached on the thin tube of the viscometer, in bulb A. When water comes above M, then it is allowed to flow downwards in the calipary tube.

5. When the water level rises till M stopwatch is started and when it comes till D it is stop-ped and the time differences is noted.

6. Now empty the viscometer and fill it with experi-mental liquid after drying in oven and calculate the time consumed for the flow of liquid (+2) using suitable method. Calculate +2 by repeating the experiment twice or thrice.

7 For calculating the density use expected density bottle or picnometer. Firstly measure a pure, dry and empty then fill with water, measure and then fill it with liquid and measure again.

Observation table

Sr.	Liquid	Expected density on t taken in flow (i)	(ii)	(iii)	(iv)	(v)	Expected viscosity
1	Water	78	78	80	80	L	7.44 mL
2.	Liquid	93	93	93	93	0.79	

Result :-

The viscosity of given liquid at 90°C temperature -e. is 7.44 mL.

Precautions :-

(i) Viscometer must be done.

(ii) The volume of water and experimental liquid should be clean.

(iii) The volume of liquid should be as much as if we pull it above E, then it should not come in mouth.

Experiment - 5

Object : Seperation and identification of three acidic (anions) and three basic (cations) radicals in given inorganic mixture.

Sr. No	Experiment	observation	Result
	Test for acidic radicals :		
1.	Non carbide solution + dil H_2SO_4	Vinegar like smell.	Weak group (CH_3COO^-)
2.	Soda + dil. HCl + neutral solution of $FeCl_3$	Red colour evolves	may be CH_3COO^-
3.	Above solution + Δ	Brown ppt	CH_3COO^- confirmed.
4.	Above solution + con. H_2SO_4	Purple fumes along with red brown fumes	Strong group may be Br^-, I^-.
5.	Above Testube + MnO_2	Surface of $CHCl_3$ sol. turns colourful	Br^- confirmed
6.	Soda + HCl sol. + Cl_2 water drop by drop	Red brown colour-ed sharp gas.	may be Br^-
7.	Exclusion of Br^- from testu-be + soda + dil. H_2SO_4 + gas. $NaNO_3$	Purple coloured shar fumes	Br^- excluded

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8.	On heating above solution after putting MnO_2 in it	Purple fumes	may be I^-
9.	Soda + dil. HNO_3 + CH_2Cl_2 + Cl_2 water	Surface of $CHCl_3$ turns purple.	I^- confirmed.
	Test for basic radicals :		
10.	Non-carbide sol^n + NaOH + Δ	NH_3 like smell	zero group present
11.	On taking a filter p rod dipped in conc. HCl near the mouth of testube	White fumes are evolved.	NH_4^+ confirmed
12.	On taking a filter paper dipped in $CuSO_4$ near the mouth of test tube	filter paper turns to blue.	NH_4^+ confirmed.
13.	Original sol. + dil. HCl	White ppt	Ist group is present.
14.	On passing H_2S in above sol^n.	Black ppt is obtain.	IInd group is present
15	Above ppt + dil. HNO_3 + Δ	ppt becomes soluable	Mg^{+2} absent.
16	Above ppt + dil H_2SO_4 + Δ + C_2H_5OH	No white ppt	Pb^{+2} absent.

17	Above sol + NH_4OH + Δ	No white ppt.	Pb^{+2} absent.
18.	Above sol. + CH_3COOH + $k_4[Fe(CO)_6]$ sol.	Chocalate brown ppt is obtained	Cu^{+2} confirmed.
19.	of II[nd] group + Δ	H_2S gas gets excluded	III[rd] group absent.
20.	Above sol + conc. HNO_3 + solid NH_4Cl + NH_4OH	No ppt is obtained	III[rd] group absent.
21.	On passing H_2S gas in the above solution	No white ppt.	IV group is presend III[rd] group absent
22.	Exclusion of H_2S gas :-		
	a) Above solution + Δ	H_2S gas evolved	H_2S gas excluded.
	b) On taking a filter paper dipped in sol. of $(CH_3[COO]Pb]$ near the mouth of test tube.	filter paper does not turn black	
23.	Above sol. + $(NH_4)_2CO_3$ sol.	No white ppt.	V group is absent
24	Above ppt + CH_3COOH + $K_2Cr_2O_4$	No yellow ppt	Ba^{+2} is absent
25	Above ppt + $(NH_4)_2SO_4$	white ppt.	Sr^{+2} present
26	on burning the	Dark deep red	Sr^{+2} confirmed

	paste of above ppt and conc. HCl in flame	flame is obtained	

Result.

There are three cationic and anionic radica -ls present in the given inorganic mixture -

(acidic) Cationic radicals → Cu^{+2}, Sr^{+2}, NH_4^+
(basic) Anionic radicals → CH_3COO^-, Br^-, I^-

Object
To determine the boiling point of organic liquid

Apparatus and chemical required :
Ethanol, thele's tube, thermometer, stand, Glycerol, etc.

Method :
1) Thele's tube filled 2/3 with glycerol.

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

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

4) Now heat the thele's tube gently after sometime air bubbles comes out from end of tube the temp. of thermometer noted.

5) 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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Experiment - 7

Object ÷ Identification of function group in organic compound and 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 compo. spetulla and 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 comp-ound + fresh $FeSO_4$ + conc. H_2SO_4	Blue or green ppt absent	N- absent
4.	functional group ÷		
(i)	2,4- Dinitrophenyl hydr-azine Test ÷ Carbon comp. + 2,4- Di phenyl	Yellow orange ppt formed	presence of carbonyl group

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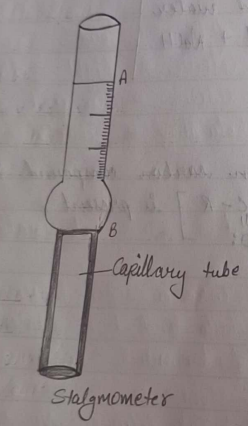
	hydrazine		
(ii)	Sodium nitroprusside Test ÷ given compound + sodium + nitroprusi -de + distilled water + shake it + NaOH solution	Red colouration	Ketonic group is present.

Result

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



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Object :-

To determine surface tension of given organic liquid by stalagmeter.

Apparatus & chemical Required :-

Stalagmometer, 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 = 46.16 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/cm³
surface tension of H_2O = 71.8
density of liquid = 1.5

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.

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	42
64	72
65	65
63	78
$n_1 = 63$	$n_2 = 72$.

Observation :-

Surface tension of liquid = 66.7829 dyne/cm.

Calculation III

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

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

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

$n_2 = 72$

$n_1 = 63$

$V_1 = 71.8 \text{ Dyne/cm}$

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

$V_2 = 67.5368 \text{ dyne/cm}$.

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.

Experiment - 9

DATE .....

Object :-

Seperation and identification of three acidic (anions) and basic (cations) radicals in given inorganic mixture.

Material Required :-

Test tube holder, burner, test tube, filter paper etc.

S.No.	Experiment	Observation	Inference
	Test for acidic radicals :-		
1.	Action of dil H_2SO_4 mix + dil. H_2SO_4	Vinegar like odour	CH_3COO^- may be
2.	Sodium carbonate ex + H_2SO_4 + diphonyl ammonia solution	deep blue colour appear	$2H_3COO^-$ Confirm
3.	Action of conc. H_2SO_4 mix + con. H_2SO_4	Colourless gas evolved with pungent order	Cl^- may be
4.	Mix + Con. H_2SO_4 combination test :-	Insoluble pungent gas	Cl^- may be present.
5.	mix + $K_2Cr_2O_7$ + Con. H_2SO_4 + Δ → gas pass in NaOH sol^n + CH_3COOH + $C(H_3COO)_2$ Pb.	Yellow coloured ppt is obtained	Cl^- confirm

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6.	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
7.	Action of dil. H_2SO_4 + mix + dil. H_2SO_4 + Δ	Colourless gas with smell of burning sulphur.	SO_3^{-2} may be
8.	On keeping wetted filter paper with dil. H_2SO_4 and $K_2Cr_2O_7$	turns filter paper in green.	SO_3^{-2} confirm
	Test for basic Radicals		
9.	Wet test :- Mix + NaOH + Δ	Amonia gas	NH_4^+ may be
10.	On taking a glass red wetted with conc. HCl to the mouth of test tube.	White furnesss are formed.	NH_4^+ confirm
11.	Add HNO_3 + Δ + dil. H_2SO_4 + C_2H_5OH + NH_4OH	No ppt is obtained	Cu^{+2} may be
12.	CH_3COOH + $K_4[Fe(CN)_6]$	Chocolatey coloured ppt.	Cu^{+2} confirm

13.	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.
14.	Residue + dil. HCl then add excess NaOH	White ppt. obtained ppt is disappear	Al^{+3} confirm

Result :→ There are three cationic and anionic radi-cals present in the given inorganic mixture.

Acidic : NO_2^{-2}, NO_3^-, Cl^-

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

Experiment - 10

DATE .....

Object :-

To prepare crystals of given pure organic solid (benzoic acid) from hot water.

Theory :-

Benzoic acid is a crystalline solid has high solubility in hot water an impure sample of benzoic acid is dissolved in hot water and then filtered to remove insoluble impurities.

Requirements :-

Crude sample of benzoic acid, 250ml measuring flask, funnel, a glass rod, and a trough.

Procedure :-

1. Take about 2-3 ml of the crude sample of benzoic acid in a 250 ml beaker, in another take about 150 ml of water and keep it for boiling.

2. Add slowly with stirring least amount of boiling water to the beaker containing crude sample of benzoic acid so then it gets dissolved easily add 0.5 g of animal charcoal to the solution and boil for a minute.

3. Filter the solution while hot using a fluted filter paper placed in a stemless funnel collect the clear filtrate in a beaker.

4. Allow the filtered solution to cool at room temperature now cool it by placing it on a beaker filled with cold water.

5. Separate the crystals by suction using Buchner funnel wash the crystals with water, dry the crystals.

6. Record the weight of the crystals.

Result :-

The crystals of benzoic acid are shining white.

Yield :-

6.5 gm.

Experiment - 11

DATE .....

Object :-

Identification of functional group in the given organic comp. and 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 and 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 solution of $FeSO_4$ + conc. H_2SO_4	Solution do not give yellow colour	N- absent.
4.	Functional group :- Hydroxyl amine hydrochloride + methanol and 2N-KOH sol^n of methol + $NH_2OH \cdot HCl$ + KOH sol$^{n.}$ + Δ + dil HCl + cool + $FeCl_3$	Radish - violet Colour appear.	ester group is present

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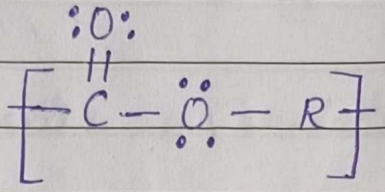
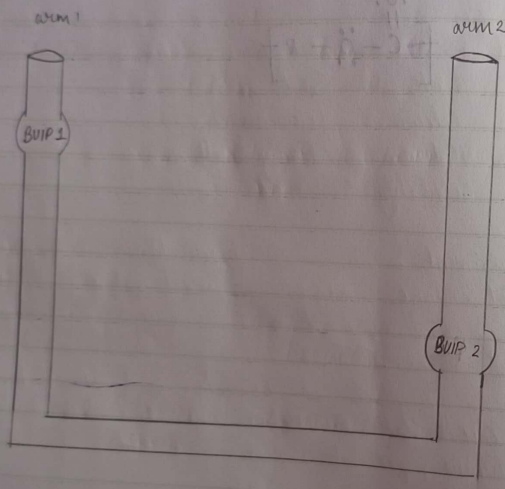
Result :-

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





Oswald Viscometer.

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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 of water
x_2 = viscosity of solution
t_1 = Time of water flow
t_2 = Time of solution flow
d_1 = density of water
d_2 = density of solution

Chemical Required :- Water solution.

Observation I^st
(i) Room temp^r = 27°C
(ii) Viscosity of H_2O = 0.1
(iii) density of H_2O = 0.1 gm / mol
(iv) density of liquid = 1.005 gm / mol.

Calculation

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

$t_2 = 80$ sec $t_1 = 70$ sec

$d_2 = 1.005$ gm/m³ $d_1 = 10$ gm

$x_1 = 0.01$

but t_1, t_2, $t_1 d_1 x$, value = incr — (1)

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

$x_2 = \frac{80 \times 1.005 \times 0.01}{70 \times 1.0} = 0.114875$ poise

[2]

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

$t_2 = 85$ sec $t_1 = 70$ sec

$d_2 = 1.01$ gm/cm² d_1 1.0 gm/cm²

$x_1 = 0.01$

$X_2 = \frac{85 \times 1.01 \times 0.01}{70 \times 1.0} = 0.0122642$ poise

[3]

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

$t_2 = 90$ Sec $t_1 = 70$ Sec

$d_2 = 1.015$ gm/cm³ $d_1 = 1$ gm/cm³

$x_1 = 0.01$ poise

$X_2 = \frac{90 \times 1.015 \times 0.1}{70 \times 1.0} = 0.01365$

[4]

$t_2 = 90$ Sec $t_1 = 70$ sec

$d_2 = 1.020$ gm/cm³ $d_1 = 1.0$ gm/cm³

$x_1 = 0.01$

Observation IInd.

i) Viscosity of water = 0.01 poise
ii) Density of water (d_1) = 100 gm/mol
iii) density of solution (d_2) = 1.01 gm/cm
iv) Lake taken in solution = 80 sec

Observation table 1st

Time taking 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 Sol^n = 0.114875 poise

Observation table IInd

Time taken by water flow (t_1)	Time taken by Sol^n flow (t_2)
70 Sec	90 Sec
75 Sec	80 Sec
6.5 Sec	80 Sec
t_1 = 70 Sec	t_2 = 80 Sec

Observation :-
Viscosity of Solution = 0.0122642 poise

$$X_2 = \frac{90 \times 1.020 \times 0.01}{70 \times 1.0} = 0.01314 \text{ poise}$$

5

$$X_2 = \frac{t_2 d_2 x_1}{d_2 t_1}$$

$$X_2 = \frac{100 \times 1.025 \times 0.01}{7.0 \times 1.0}$$

$$= 0.014464 \text{ poise}$$

$t_2 = 100$ sec

$d_2 = 1.025$ gm/cm^3

$t_1 = 70$ sec

$d_1 = 1.0$ gm/cm^3

$x_1 = 0.01$

Observation Table - IIIrd

Time taken by water flow (t_1)	Time taken by sol^n flow (t_2)
70 Sec	90 Sec
75 Sec	85 Sec
65 Sec	95 Sec
t_1 = 70 Sec.	t_2 = 90 Sec

Observation

Viscosity of solution = 0.01365 poise.

Observation table IVth

Time taken by water flow (t_1)	Time taken by sol^n flow (t_2)
70 Sec	85 Sec
75 Sec	90 Sec
65 Sec	96 Sec
t_1 = 70 Sec	t_2 = 90 Sec.

Observation

Viscosity of sol^n (η_2) = 0.13114 poise

Observation table Vth

Time taken by water flow (t_1)	Time taken by sol^n 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 sol^n at 27°C = 0.01464 poise

Object :-

Identification of functional group in given organic compound and also known observe element test

Primary Test :-

State :- Solid
Odour :- Sweet smell
Colour :- White
Solubility :- Water Soluble

S.No	Experiment	Observation	Inference
1.	Flam test :- Take a organic comp. on spetulla & 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 sol^{n} of $FeSO_4$ + conc. H_2SO_4	Litmus do not change	N_2 absent
4.	Functional group :-		
(i)	2,4- dinitrophenyl hydrogen Test :- Organic comp + 2,4-dinitrophenyl hydroxine	Yellow orange ppt formed	Carbonyl group present

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(ii)	Nitrogen 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 -

Object : In the given carbonic compound, test the element and identify the functional group present in compound.

Primary test :-

Physical state : liquid / solid

colour : light pink

smell : Phenolic

Solubility : Soluable in water

Sr.	Experiment	Observation	Result
1.	Lessane solution preparation. sodium + NaOH + freshly prep.-ared $FeSO_4$ sol. + heat it and add 2-3 drops of H_2SO_4	Green ppt.	N - absent
2.	Add sodium nitroperoxide to sodium	colour of sol. do-esn't turn purple.	S - absent
3.	1ml lessane sol. + Acetic acid + 2-3 drops lead ac-etate	Ppt. does not tu-rn black.	S - absent
4.	1ml lessane sol. is heated along will HNO_3 in test-tube cooling down the solution and adding silver nitrate to it.	AgO yellow and white ppt.	Cl, Br, I halogens are absent

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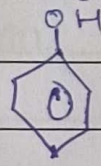
5. On dropping 2-3 drops of the liquid solution of compound on blue filter paper	Blue litmus paper turns red	Acidic phenol or $-COOH$ group present
6. On adding 5% sodium bicarbonate solution in the liquid solution of compound	colourless	Phenolic group is present
7. Libermann's Test		
i) a little amount of substance + little bit of $NaNO_2$ + 1ml H_2SO_4 + heat slightly	Blue or green colour	Phenolic group is present.
ii) On concentrating blue or green solution in water	Red colour	
iii) On putting NaOH in above sol.	Again green or blue colour	Phenolic group's present
8. Ferric chloride test :- little bit of alcoholic or liq. sol. of subs. in test tube + adding 2-3 drops of neutral $FeCl_3$	Blue, purple or green colour	Phenolic group is present
9. Phthalein Dye Test :-		
i) little substance + Pthalic anhydride + Conc. H_2SO_4 + heat & add NaOH sol.	pink colour	Phenolic group is present

ii)	cool it and add it to beaker half filled with water	Green ppt	
10.	Phenol + conc. HNO_3 + conc. H_2SO_4		2,4-dinitroph-enol

In the given carbonic comp., there is a phenol-ic  group.

Experiment = 15

DATE .....

Object :-

To determine percentage composition of given binary mixture (acetone and ethyl methyl ketone) by surface tension method.

Apparatus :-

Stalagmometer, Beaker, organic liquid.

Principle :-

A number of solution of acetone and ethyle methyl ketone are prepared and the number of drops are constant in each case when the mixture ferrous in between the upper and lower marks in salgometer.

The surface tension or number of drops are then found out in case of unknown mixture. where conseruation can then be determined from graph.

Observation :-

n_1 = 72.75 dyne/cm

d_1 = 1 gm/ml

d_2 = 1.078 gm/ml

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Calculation %

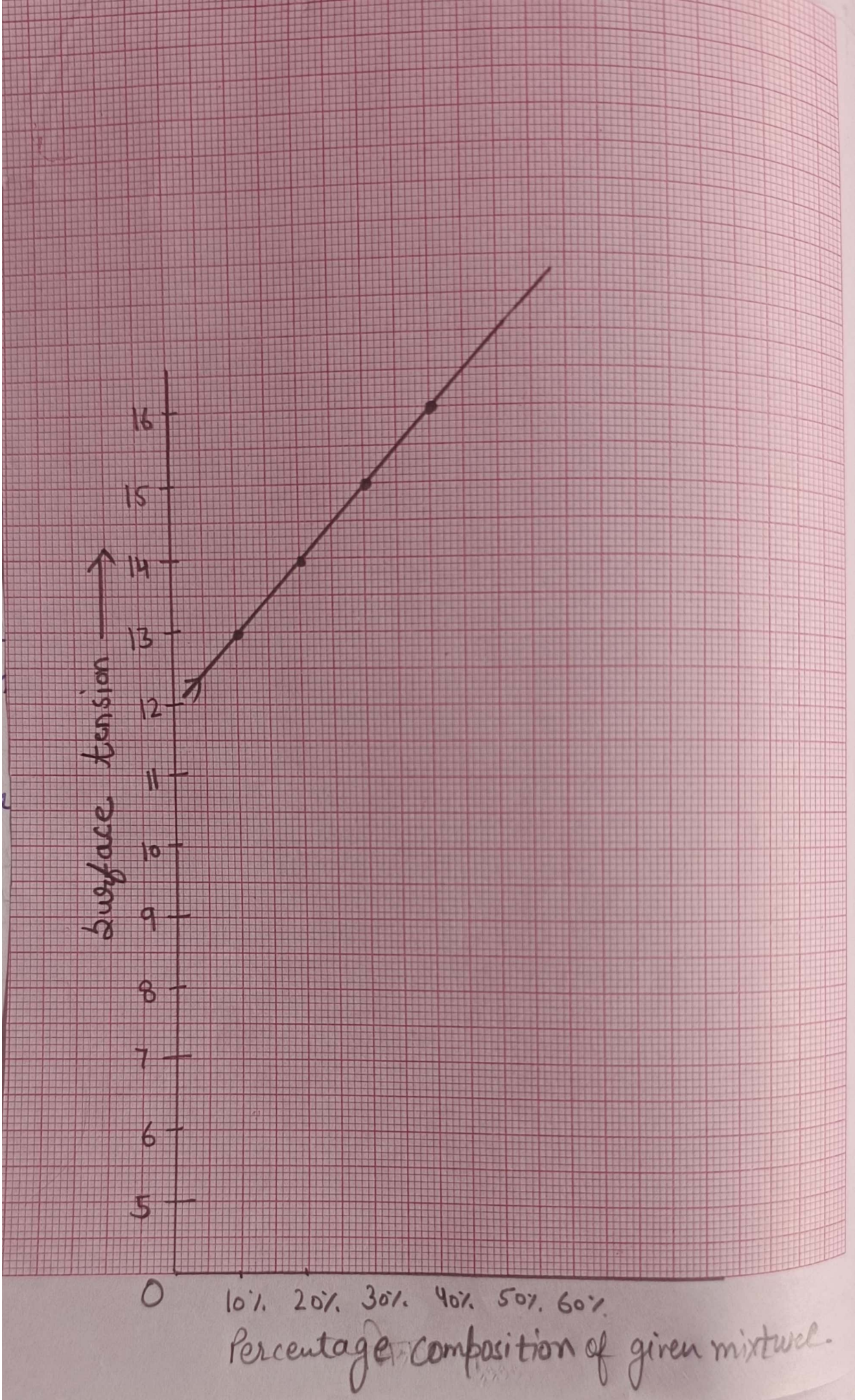
10% = $\frac{8}{n_2}$ ⇒ $\frac{1.31 \times 1.00}{2.022 \times 1.088}$ ⇒ 13.29

20% = $\frac{8}{n_2}$ ⇒ $\frac{1.31 \times 1.00}{2.24 \times 1.078}$ ⇒ 14.74

30% = $\frac{8}{n_2}$ ⇒ $\frac{1.31 \times 1.00}{8.26 \times 1.078}$ ⇒ 15.53

40% = $\frac{8}{n_2}$ ⇒ $\frac{1.31 \times 1.00}{2.56 \times 1.078}$ ⇒ 14.87

unknown ⇒ $\frac{1.31 \times 1.00}{n_2}$ ⇒ $\frac{}{2.21 \times 1.78}$ ⇒ 14.36


Surface tension
16
15
14
13
12
11
10
9
8
7
6
5
0
10%
20%
30%
40%
50%
60%
Percentage composition of given mixture.

Observation table :-

S.No.	Liquid	Time taken by water flow (t_1)	Time taken by organic liquid (t_2)	Viscosity
1.	10%	1.30	2.02	13.39
2.	20%	1.34	2.024	14.74
3.	30%	1.32	2.36	15.53
4.	40%	1.32	2.26	14.87
5.	Unknown	1.30	2.21	14.36

Result :-

The percentage composition of given liquid is 15 %.

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Pratical Assignment Work

s-1 Seperation and Identification of three acidic anions) and three basic (cations) radicals in given inorganic mixture.

.2 To prepare crystals of given pure organic olid (benzoic acid) from hot water

es-3 Identification of functional group in the iven organic compound and also observe element test.

es-4 Find out viscosity of given liquid with help of viscometer.

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Practical Assignment WORK

Experiment = 1

Object :-

Seperation and identification of three acidic (anions) and basic (cations) radicals in given inorganic mixture.

Material Required :-

Test tube holder, burner, test tube, filter paper etc.

S.No	Experiment Test for acidic radicals	observation	Inference
1.	Action of dil H_2SO_4 mix + dil. H_2SO_4	Vinegar like odour.	CH_3COO^- may be
2.	Sodium carbonate ex + H_2SO_4 + dip -honyl ammonia solution	deep blue col -our appear.	CH_3COO^- confirm
3.	Action of conc. H_2SO_4 mix + con. H_2SO_4	Colourless gas ev -oluent with pu -ngent order	Cl^- may be.
4.	Mix + Con. H_2SO_4 combination test :-	Insoluble pung -ent gas.	Cl^- may be present.
5.	Mix + $K_2Cr_2O_7$ + Con. H_2SO_4 + $\Delta \rightarrow$ gass pass in NaOH Sol^n + CH_3COOH + $(CH_3COO)_2.Pb$	Yellow coloured ppt is obtain -ed	Cl^- confirm

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6.	Action of dil. H_2SO_4 mix + dil. H_2SO_4 + heat	CO_2 gas evolved colourless gas evo-lved.	CO_3^{+2} may be SO_3^{-2} may be
7.	Action of dil. H_2SO_4 + mix. + dil. H_2SO_4 + Δ	Colourless gas with smell of burning sulphur	SO_3^{-2} may be
8.	On keeping wetted filter paper with dil. H_2SO_4 and $K_2Cr_2O_7$	Turns filter paper in green	SO_3^{-2} confirm
	Test for basic Radicals		
9.	Wet test ÷ Mix + NaOH + Δ	Amonia gas	NH_4^+ may be.
10.	On taking a glass rod wett-ed with conc. HCl to the mouth of test tube.	White furness are formed	NH_4^+ confirm
11.	Add HNO_3 + Δ + dil. H_2SO_4 + C_2H_5OH + NH_4OH	No ppt is obtain-ed	Cu^{+2} may be
12.	CH_3COOH + $K_4[Fe(CN)_6]$	Chocolatey coloured ppt.	Cu^{+2} confirm
13.	Add conc. H_2SO_4 + boil + NH_4Cl solution + 0.5 + NH_4OH + dil. HNO_3 + heat.	White gelatinous ppt is obtained.	Al^{+3} may be

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1. Residue + dil. HCl then add excess NaOH	white ppt obtained ppt is disappear	Al^{+3} confirm

Result :- There are three cationic and anionic radicals present in the given inorganic mixture.

Acidic :- NO_2^{-2}, NO_3^-, Cl^-

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

 Experiment = 2

Object :-
To prepare crystals of given pure organic solid (benzoic acid) from hot water.

Theory :-
Benzoic acid is a crystalline solid has high solubility in hot water an impure sample of benzoic acid is dissolved in hot water and then filtered to remove.

Requirements :-
Crude sample of benzoic acid, 250 ml measuring flask, funnel, a glass rod and a trough.

Procedure :-
1. Take about 2-3 ml of the crude sample of benzoic acidic a 250 ml beaker, in another take about 150 ml of water and keep it for boiling.

2. Add slowly with stirring least amount of boiling water to the beaker, in another take about 150 ml of water and keep it for boiling. 0.5 g of animal charcoal to the solution and boil for a minute.

3. Filter the solution while hot using a fld fluted filter paper placed in a stemless funnel collect the clear filterate in a beaker.

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. Allow the filtered solution to cool at room temperature now cool it by placing it on a beaker filled with cold water.

. Seprate the crystals by suction using Buchner funnel wash the crystals with water, dry the crystals.

. Record the weight of the crystals.

Result :-
The crystals of benzoic acid are shining white.

Yield :- 6.5 gm.

Experiment - 3

Object :-

Identification of functional group in the given organic comp. and also observe element test.

Primary Test :-

State :- Solid
Colour :- Colourless
Odour :- Fruity smell
Solubility :- Soluble.

No.	Experiment.	Observation.	Inference.
1.	Flame test :- Take a organic comp on and burn it with help of burner.	Gives white fumes	Aliphatic compound
2.	Litmus Test :- Take on. Red or blue litmus paper into carbo -n comp. solution.	turns blue litmus -s to red.	Acidic
3.	Nitrogen Test :- Organic. comp. + Fre. -sh solution of $FeSO_4$ + conc. H_2SO_4	Solution do not give yellow colour	N - absent.
4.	functional group :- Hydroxyl amine hydrochloride + methanol and 2N-KOH sol^n of methol + $NH_2OH \cdot HCl$ + KOH sol^n + Δ + dil HCl + cool + $FeCl_3$	Reddish - violet colour appea -r	Esters group is present.

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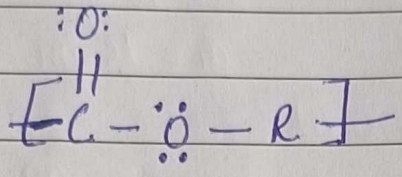
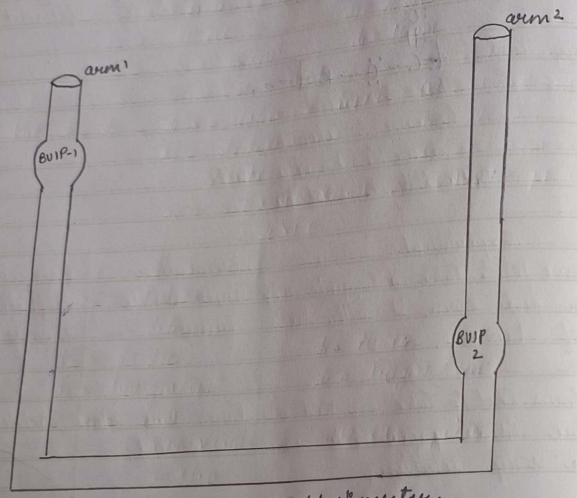
Result :-

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





Oswald Viscometer.

PAGE NO. 1a1 Experiment = 4 DATE

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 of water.
x_2 = viscosity of solution.
t_1 = Time of water flow.
t_2 = Time of solution flow.
d_1 = density of water.
d_2 = density of solution

Chemical Required :- Water solution

Observation I^st
(i) Room temperature => 27°c
(ii) viscosity of H_2O => 0.1
(iii) density of H_2O => 0.1 gm/mol.
(iv) density of liquid => 1.005 gm/mol.

Calculation :-

(1) $x_2 = \frac{t_2 d_2 x_1}{t_1 d_1}$

$t_2 = 80$ sec $\quad t_1 = 70$ Sec

$d_2 = 1.005$ gm/m^3 $\quad d_1 = 10$ gm

$x_1 = 0.01$

but $t_1, t_2, t_1 d_1 x$, values = inner — ①

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

$x_2 = \frac{80 \times 1.005 \times 0.01}{70 \times 1.0}$ ② 0.14875 poise

(2) $x_2 = \frac{t_2 d_2 x_1}{t_1 d_1}$

$t_2 = 85$ Sec $\quad t_1 = 70$ Sec

$d_2 = 1.01$ gm/cm^2 $\quad d_1 = 1.0$ gm/cm^2

$x_1 = 0.01$

$x_2 = \frac{85 \times 1.01 \times 0.01}{70 \times 1.0} = 0.0122642$ poise

(3) $x_2 = \frac{t_1 d_2 x_1}{t_1 d_1}$

$t_2 = 90$ Sec $\quad t_1 = 70$ Sec

$d_2 = 1.015$ gm/cm^3 $\quad d_1 = 1$ gm/cm^3

$x_1 = 0.01$ poise

$x_2 = \frac{90 \times 1.015 \times 0.1}{70 \times 1.0}$ ② 0.01365

Observation IInd.

1) Viscosity of water ⇒ 0.01 poise.
2) Density of water (d_1) ⇒ 100 gm/mol
3) Density of solution (d_2) ⇒ 1.01 gm/cm
4) Like taken in solution ⇒ 80 sec

Observation table. Ist

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 Sol^n = 0.114875 poise

Observation table IInd

Time taken by water flow (t_1)	Time taken by solution 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 solution = 0.0122642 poise.

Observation Table. IVth

Time taken by water flow (t_1)	Time taken by solution flow (t_2)
70 Sec	95 Sec
70 Sec	85 Sec
65 Sec	90 Sec
t_1 = 70 Sec	t_2 = 90 Sec

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(4) $t_2 = 90$ sec $\quad t_1 = 70$ sec

$d_2 = 1.020$ gm/cm^3 $\quad d_1 = 1.0$ gm/cm^3

$\eta_1 = 0.01$

$$\eta_2 = \frac{90 \times 1.020 \times 0.01}{70 \times 1.0} \Rightarrow 0.13114 \text{ poise.}$$

(5)

$$\eta_2 = \frac{t_2 d_2 \eta_1}{d_1 t_1}$$

$$\eta_2 = \frac{100 \times 1.025 \times 0.01}{70 \times 1.0}$$

$\Rightarrow 0.01464$ poise

$t_2 = 100$ sec

$d_2 = 1.025$ gm/cm

$t_1 = 70$ sec

$d_1 = 1.0$ gm/cm^3

$\eta_1 = 0.01$

Observation.

Viscosity of solution = 0.01365 poise

Observation table IVth

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

Observation

Viscosity of Sol^n (x_2) = 0.13114 poise.

Observation table Vth

Time taken by water flow (t_1)	Time taken by sol^n 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 sol^n at 27°C = 0.01464 poise