

**Max.Marks:60**

**Time: 7 Hrs.**

**(One day in two sessions i.e. 9:00AM-12:30PM and 1:30PM-5:00PM)**

**Section-A (Inorganic)**

Semimicro qualitative analysis of mixture containing not more than four radicals (excluding interfering. Combinations and insolubles):

$Pb^{2+}$ ,  $Hg^{2+}$ ,  $Hg_2^{2+}$ ,  $Ag^+$ ,  $Bi^{3+}$ ,  $Cu^{2+}$ ,  $Cd^{2+}$ ,  $As^{3+}$ ,  $Sb^{3+}$ ,  $Sn^{2+}$ ,  $Fe^{3+}$ ,  $Cr^{3+}$ ,  $Al^{3+}$ ,  $Co^{2+}$ ,  $Ni^{2+}$ ,  $Mn^{2+}$ ,  $Zn^{2+}$ ,  $Ba^{2+}$ ,  $Sr^{2+}$ ,  $Ca^{2+}$ ,  $Mg^{2+}$ ,  $NH_4^+$ ,  $CO_3^{2-}$ ,  $S^{2-}$ ,  $SO_3^{2-}$ ,  $S_2O_3^{2-}$ ,  $NO_2^-$ ,  $CH_3COO^-$ ,  $Cl^-$ ,  $Br^-$ ,  $I^-$ ,  $NO_3^-$ ,  $SO_4^{2-}$ ,  $C_2O_4^{2-}$ ,  $PO_4^{3-}$ ,  $BO_3^{3-}$

**Section-B (Physical)**

1. To determine the strength of the given acid solution (mono acid only) conductometrically.
2. To determine the solubility and solubility product of a sparingly soluble electrolyte conductometrically.
3. To determine the strength of given Ferrous ammonium sulphate solution potentiometrically.
4. To determine the molecular weight of a non-volatile solute by Rast method.
5. Preparation of acidic and basic buffers and comparison of their pH with theoretical values.
6. To determine the specific rotation of optically active substance (any two).

**Section-C (Organic)**

**1. Thin Layer Chromatography**

(Determination of  $R_f$  values and identification of organic Compounds)

Separation of a mixture of coloured organic compounds using common organic solvents.

**2. To separate the binary liquid mixtures using distillation.**

**3. Synthesis of the following organic compounds:**

- (a) To prepare salicylic acid from Aspirin.
- (b) To prepare p-bromoaniline from p-bromoacetanilide.
- (c) To prepare m-nitroaniline from m-dinitrobenzene.
- (d) To prepare S-Benzyl-iso-thiuronium chloride from Thiourea.

**Distribution of marks**

1.	Section- A	15 marks
2.	Section-B	15 marks
3.	Section-C	15 marks
4.	Viva-voce	05 marks
5.	Lab Record	10 marks

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Principal  
SNRL Jairam Girls College  
Lohar Majra, Kurukshetra

SNRL Jairam Girls College, Lohar Majra, Kurukshetra

B.Sc 3rd Year (2023-24) Chemistry Practicals

Sr.No	Class Roll	University Roll No	Regn. No	Name	Father Name
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2	1212122015002	210038205	21-JL-134	KRITI	JAIPAL
3	1212122015003	210038202	21-JL-150	PALAK	KRISHAN
4	1212122015004	210038201	21-JL-151	KOMAL	JOGINDER SINGH
5	1212122015008	210038203	21-JL-137	KOMAL DEVI	KRISHAN KUMAR

DA-I

  
Principal  
SNRL Jairam Girls College  
Lohar Majra, Kurukshetra

S.N.A.L JAIRAM GIRLS COLLEGE

PRACTICAL

FILE

OF

CHEMISTRY

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# CHEMISTRY

PRACTICAL RECORD BOOK



Name: ..... Palak ..... Class: B.Sc.-III ..... Roll No.: 210038202



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## Experiments Performed

S.No.	Particulars	Date	Page	Teacher's Signature
1.	Separate the green leaf pigments by thin layers chromatography and calculate their R <sub>f</sub> values.	26/08/23	1-3	
2.	Separate mixture of coloured organic compound by thin layer chromatography using mixture of cyclohexane and ethyl acetate in ratio of 8:5:15.	12/09/23	4-5	
3.	To prepare a sample of pure m-nitroaniline from m-dinitrobenzene.	20/09/23	6-7	
4.	To prepare a sample of pure s-Benzyl isothiourea chloride from thiourea.	7/10/23	8-9	
5.	To prepare p-bromoaniline from bromoacetanilide.	21/10/23	10-11	
6.	To prepare o-chlorobenzoic acid from anthranilic acid.	12/02/24	12-13	

## Experiments Performed

S.No.	Particulars	Date	Page	Teacher's Signature
7.	To determine the strength of HCl acid by sodium hydroxide using pH-meter.	27/02/24	14-15	
8.	Find out the strength of given solution of HCl acid (N/10) by titrating against NaOH sol <sup>n</sup> by a conductometric method.	13/03/24	16-17	
9.	Find out the strength of sol <sup>n</sup> acetic acid by titrating against sodium hydroxide sol <sup>n</sup> by a conductometric method.	16/03/24	18-19	
10.	To determine the strength of sol <sup>n</sup> by titrating against N/2 NaOH potentiometrically.	22/03/24	20-21	
11.	To analyse the mixture for acid base radicals by dry and heat test.	30/03/24	22-25	



Aim :- Separate the green leaf pigments by thin layer chromatography and calculate their  $R_f$  values.

Apparatus :- Glass plates, wide mouth bottle with air tight lids, glass Jar with lids, tong, silica gel, chloroform, spinach leaves extract, alcohol etc.

Procedure :-

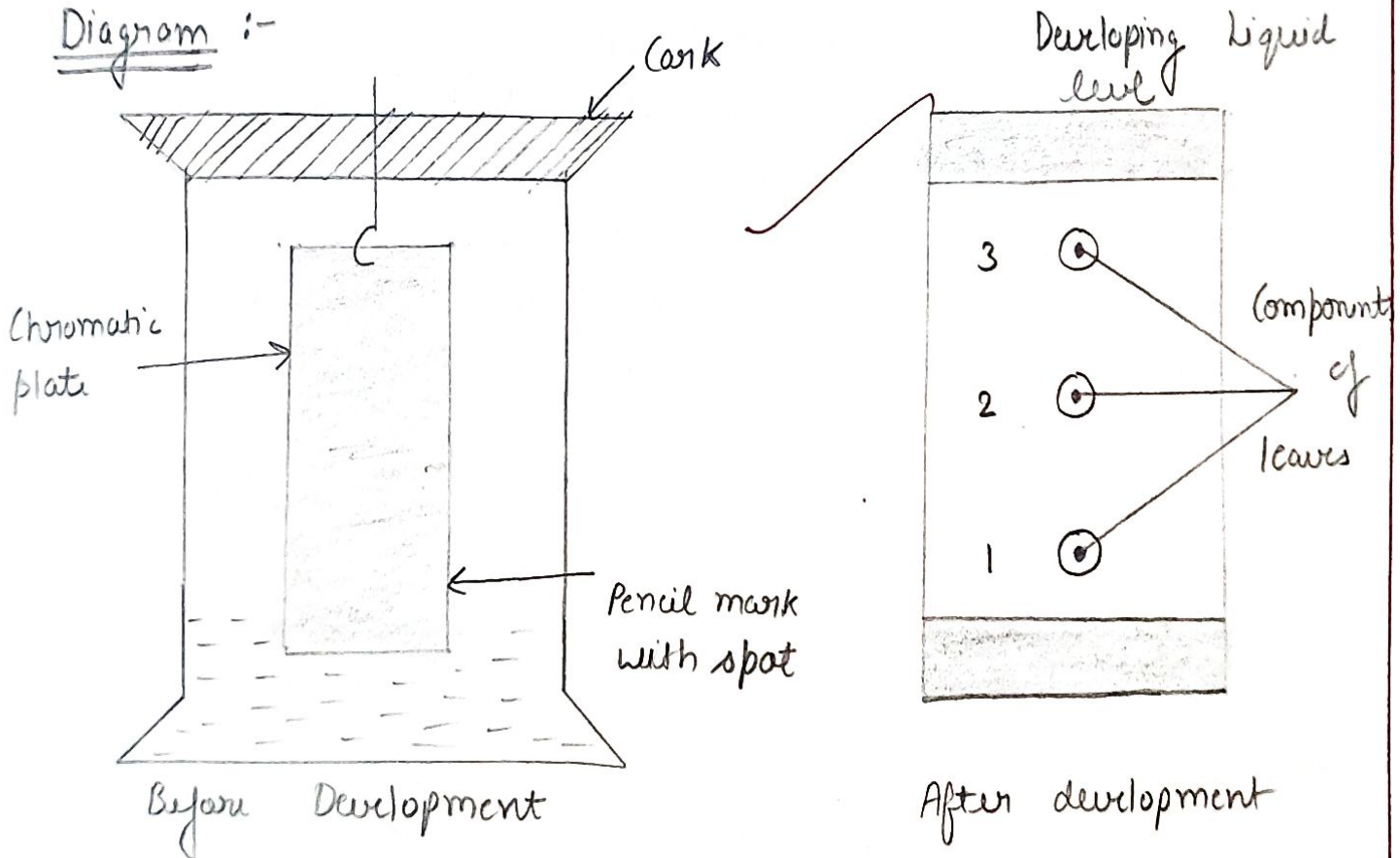
- ① Added in small installment about 30 gram of silica gel to 100 ml of chloroform in a wide mouthed bottle with constant motion. Keeping the bottle tightly stoppered. The paste so obtained is slurry of adsorbent. In the same way we can prepare a slurry of alumina in alcohol.
- ② Holding the two plates together with a pair of tongs obtain a uniform coating of the slurry on one side of each plates by alternately dipping and removing the slices quickly. Do not dip top one (1 cm) of the plates. Allowed it to dried.
- ③ Holding the top edges, separate about two plates and place them on a filter paper



Aim :- Separate the green leaf pigments by thin layers chromatography and calculate their  $R_f$  values.

Apparatus :- Glass plate, wide mouthed bottles with air tight lids, glass jar with lids tong, silica gel, chloroform, spinach leaves, alcohol etc.

Diagram :-



Formula Used

$$R_f = \frac{\text{Distance travelled by component spot}}{\text{Distance travelled by solvent front}}$$

their different properties and nature, rise with different speeds producing different spots. When the liquid has rise to a distance of about 15cm remove it from the jar.

- (9) Make the centroid point of each spot and measure the distance travelled by spot.
- (10) Calculate  $R_f$  value of spot responding to different components

Result :-

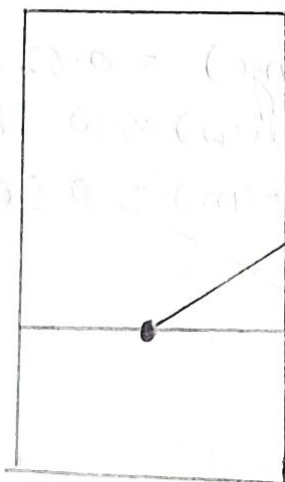
$R_f$  value of I<sup>st</sup> Pigment (orange) = 0.62 cm  
 $R_f$  value of II<sup>nd</sup> Pigment (yellow) = 0.51 cm  
 $R_f$  value of III<sup>rd</sup> Pigment (green) = 0.56 cm

W.A.P.  
12/9/23

Aim :- Separate a mixture of coloured organic compound (fluorescein & methylene blue) by thin layer chromatography using mixture of cyclohexane and ethyl acetate in ratio of 8.5 : 1.5

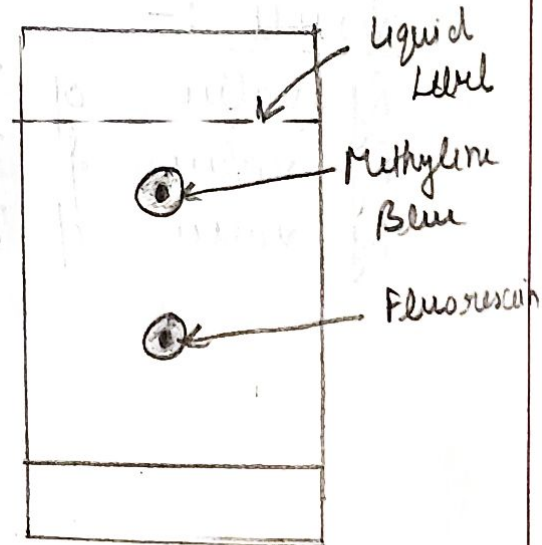
Apparatus :- Glass plate, wide mouthed bottles, with air tight lids, glass with lids, tongs, silica gel, chloroform, fluorescein, methylene blue, cyclohexane, ethyl acetate etc.

Diagram :-



Spot of mixture solution

Before Development



After development

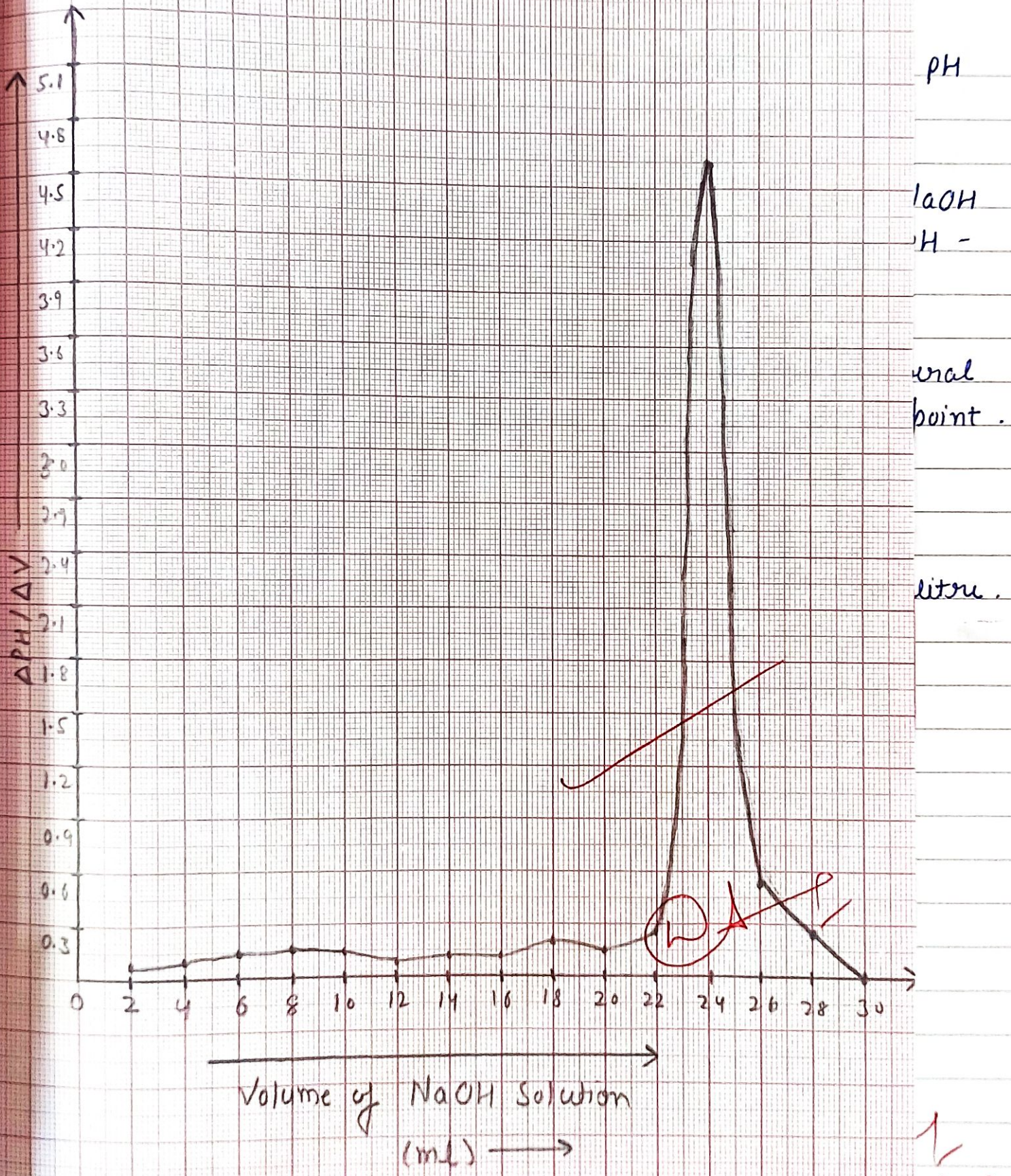
Formula Used :-

$$R_f = \frac{\text{Distance travelled by the component spot}}{\text{Distance travelled by solvent front}}$$

- taken in a clean and dry test tube with shaking. This is required mixture sol<sup>n</sup>.
- ④ Draw a horizontal line with lead pencil on glass plate about 2m from bottom.
  - ⑤ With the help of capillary tube, applied a drop of mixture solution on chromatography plates at about its centre. Let the drop dry in air.
  - ⑥ Lower the glass plate into chromatography jar in such a way that it does not touch side of jar and hangs vertically straight.
  - ⑦ Take the developing agents in ratio of 8.5 : 1.5 in such quantity in jar so that liquid does not touch the spot directly.
  - ⑧ Mark the level of raise the developing agent of liquid with pencil. Dry the plate with drier.
  - ⑨ There is no need of any visualising agent in this case components are coloured.
  - ⑩ Mark the central point of each spot & measure the distance travelled by each spot and developing agent.

Result :-

R<sub>f</sub> value for one component (Pink) = 0.238 cm  
 R<sub>f</sub> value for other component (Orange) = 0.748 cm



Calculation :-

$$\begin{aligned} N_1 V_1 &= N_2 V_2 \\ N_1 \times 20 &= \frac{1}{2} \times 5 \\ N_1 &= \frac{5}{40} = 0.125 \text{ N} \end{aligned}$$

∴ Strength of HCl = Normality × Eq. wt.  
 $= 0.125 \times 36.5 = 4.5625 \text{ g/litre}$

Result :-

Strength of HCl solution = 4.5 g/litre

