



INDIAN SCHOOL AL WADI AL KABIR

CLASS: XII	DEPARTMENT: SCIENCE 2020 -2021 SUBJECT : CHEMISTRY	DATE: 17.09.2020
HANDOUT	TOPIC: CHEMISTRY PRACTICAL : EXPT 5 : IDENTIFY THE FUNCTIONAL GROUPS EXPT 6 : ANALYSIS OF PROTEIN AND CARBOHYDRATES EXPT 7: PAPER CHROMATOGRAPHY	NOTE: A4 FILE FORMAT
NAME OF THE STUDENT:	CLASS & SEC:	ROLL NO:

EXPT 5: IDENTIFY THE FUNCTIONAL GROUPS

Aim: To determine the functional group present in the given organic compound.

Experiment	Observation	Inference
I TEST FOR PHENOLS(ArOH)		
1 ml of the given sample is treated with neutral FeCl ₃	Violet colouration	Presence of phenolic group.
<u>Liebermann's test</u> To a small amount of the substance add 1 ml conc. H ₂ SO ₄ cool and add NaNO ₂ and dilute with water	A deep blue green colour which turns red on the dilution.	Presence of the phenolic group
II TEST FOR ALDEHYDES(-CHO group)		
Mix 1 ml of the given sample with 2ml of Fehling's solution (A+B) and heat on a water bath.	A reddish brown precipitate is formed	Presence of aldehyde group
Mix 1ml of the given sample with 1ml of Tollen's reagent and heat on a water bath .	A silver mirror is formed on the inner walls of the test tube.	Presence of -CHO group
III TEST FOR KETONES $>C=O$ group		
Add NaHSO ₃ to the compound	A white precipitate is formed	Presence of carbonyl group
To a small amount of the substance a small amount of I ₂ and NaOH is added slowly.	A yellow precipitate is formed	Presence of methyl ketone.
IV TEST FOR CARBOXYLIC ACID(-COOH group)		
Add a little of a saturated solution of NaHCO ₃	Brisk effervescence of a colourless odourless gas which turns limewater milky	Presence of carboxylic acid group

Mix 1ml of the given sample with 1ml of ethanol and 1-2 drops of concentrated sulphuric acid. Heat the mixture on a boiling water bath for 5 minutes. Remove the test tube from the water bath, pour the contents into beaker containing about 25ml water and note the smell.	A pleasant fruity smell of ester is evolved.	Presence of carboxylic acid is confirmed.
V TEST FOR AMINO (NH₂) group		
Shake 2-3 ml of the given organic compound with dil. HCl	The compound dissolves	Presence of –NH ₂ group
Take 1 ml of each of the organic compound, conc. HCl, NaNO ₂ solution and β-naphthol solution in four different test tubes. Cool them below 5 °C in an ice bath. Mix them one by one (stir with glass rod) in the order given.	A red orange coloured dye is obtained	Presence of –NH ₂ group

Result: The presence of functional groups has been identified.

EXPT 6: ANALYSIS OF PROTEIN AND CARBOHYDRATES

Aim: To analyse the presence of protein and carbohydrates in the given samples.

EXPERIMENT	OBSERVATION	INFERENCE
PROTEINS		
Treat the given sample solution with few drops of Ninhydrin and heat	Violet colouration	Presence of protein
Acidify a dilute solution of sample with acetic acid and shake.	Froth is formed	Presence of protein
Treat a dilute solution of sample with few drops of conc. HNO ₃ followed by Millon's reagent.	White precipitate turns red on heating	Presence of protein
CARBOHYDRATES		
Mix 1 ml of the given sample with 2ml of Fehling's solution (1 ml each of A and B) and heat on water bath	A reddish brown precipitate is formed.	Presence of carbohydrate.
Mix 1 ml of the given sample with 1 ml of Tollen's reagent and heat on water bath	A silver mirror is formed on the inner walls of the test tube.	Presence of carbohydrate is confirmed

Result : The functional groups present in the given samples are analysed.

Preparation of Tollen's Reagent: Wash a test tube with little of NaOH solution and take about 1ml of Silver nitrate (AgNO₃) solution. A black precipitate formed just dissolves in minimum quantity of NH₄OH solution (Add dropwise carefully).

EXPT 7. PAPER CHROMATOGRAPHY

Aim: To separate coloured compounds from mixture of ink by ascending paper chromatography and compare the R_f of the compounds present.

Requirements: Chromatography paper, glass jar, capillary tube, ruler, pencil, mixture of inks, distilled water, etc.

Theory: The coloured components present in the ink mixture can be separated placing 1-2 drops of mixture on one end of the chromatography paper and eluting it using distilled water as the mobile phase.

The R_f value is calculated as follows:

$$R_f = \frac{\text{Distance traveled by the coloured component}}{\text{Distance traveled by the elute (distilled water)}}$$

Procedure:

1. One end of the chromatography paper is cut like a wedge.
2. Draw a reference line 1 inch away from the tip of the wedge using a pencil and ruler.
3. Using capillary tube place 1-2 drops of the ink mixture at the end of the reference line drawn. This process is called spotting.
4. The paper is then fixed over a gas jar in which distilled water is taken in such a way that the tip of the chromatography touches the water.
5. After about 20-30 minutes, the chromatography paper is removed. Pencil mark is made to note the distance travelled by the elute (Water).
6. Dry the chromatography paper and calculate the R_f values.

Precautions:

1. A fine capillary tube should be used so that the diameter of the spot is small.
2. The glass jar should not be disturbed.
3. The chromatography paper should not touch the sides of the gas jar.
4. The spot should lie above the level of the elute in the gas jar

Result:

1. The R_f value of the 1st component=
2. The R_f value of the 2nd component=

Prepared by Mr. Pravin Kumar	Checked by : HOD –SCIENCE
------------------------------	---------------------------