

Object:— To extract DNA from onion.

Requirements:— Sodium chloride, liquid detergent, ethanol etc.

Theory:— DNA is the genetic material found in nucleus of every living cells.

DNA is a long polynucleotide chain and it has double helical structure.

Method:— For each onion, make a solution consisting of one tablespoon (10 ml) of liquid dishwashing detergent cup 250 ml beaker Add distilled water to make a final volume of 100 ml

Put the measuring cup in a hot water bath at 55-60°C for 10-12 minutes. During this time press the chopped onion mixture against the side of the measuring cup with the back of because the DNA will begin to break down.

During this time press the ~~back of the spoon~~ Do not keep the mixture in the hot water bath for more than 15 minutes because the DNA will begin to break down.

chopped onion mixture against the side of the measuring cup with the back of spoon

Dispense the onion solution into test tubes one for each student. For most uniform results among test tubes, stir the solution frequently when dispensing it into the tubes.

- (i) warm for 2-3 min
- (ii) continue stirring
- (iii) cool
- (iv) filter



Residue

Discard it

Filtrate

- (i) Take little filtrate in a petridish (or beaker)
- (ii) place it on ice bath
- (iii) Add little alcohol after 4-5 minute DNA is separated as white thread like structure

Result :- DNA separated as thread like structure.

Object:— To identify the given sample of sugar as reducing and non-reducing sugar.

Requirement:— Fehling solution A, Fehling solution B, Tollen's reagent etc

Theory:— Reducing sugar give a Fehling's test and Tollen's test. Non reducing sugars do not give Fehling's test and Tollen's reagent. Reducing sugar have hemiacetal or hemiketal structure.

Method:—

Identifying compound A

S.N.	Experiment	Observation	Inference
(i)	Dissolve a small amount of given glucose in a test tube containing water and add 1 ml of Fehling solution A and 1 ml Fehling solution B and heat it.	Red ppt	Reducing sugar
(ii)	Dissolve a small amount of compound in water in a test tube and add 1 ml Tollen's reagent	Silver mirror obtained	Reducing sugar

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and heat it

(3)	Add iodine solution in aqueous solution of glucose	No Reaction	Reducing sugar
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Identifying compound B

S. No.	Experiment	Observation	Inference
①	Dissolve a small amount of given starch in a test tube water containing and add 1 ml of Fehling A and 1 ml Fehling B solution and heat it	No Reaction	Non-reducing sugar
②	Dissolve a small amount of compound in water in a test tube and add it 1 ml tollen's reagent and heat it.	No Reaction	Non-reducing sugar
③	Add iodine solution in aqueous solution of starch	Blue colour	Non-reducing sugar

Result! — Sugar A is reducing and sugar B is Non-Reducing.

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Object: — To separate the given amino acid mixture by paper chromatography and determine their R_f value.

Requirement: — chromatography sheet, Gas developing solvent.

Theory: — It is a separatory technique discovered by Tswett for separating the chlorophyll pigment. There are two phases in chromatography.

- ① Stationary Phase
- ② Mobile Phase

Depending on stationary and mobile phases these are following type of chromatography.

- ① Paper chromatography
- ② Thin layer chromatography
- ③ Gas liquid chromatography
- ④ High Performance liquid chromatography

Method: — Use a toothpick to put a small drop of the solution onto the paper at the appropriate mark along the line.

When the solvent has evaporated transfer another drop to the paper. Repeat this 4 or 5 times allowing the spot to dry each time.

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Calculation :—

$$R_f = \frac{\text{Distance travelled by solution}}{\text{Distance travelled by solvent}}$$

$$R_f A = \frac{3.0}{12.5} \Rightarrow 0.24$$

$$R_f B = \frac{4.7}{12.5} \Rightarrow 0.37$$

The goal is to keep the spot under 1 mm in diameter. Use a clean dry 800 ml beaker and the developing solvent (Butanol / acetic acid / water) Use a glass rod to add enough solvent to the beaker to cover the bottom to about 0.5 cm in depth. Spotted edge down into the beaker containing the solvent solution. The pencil line with the spots must be above the liquid level. The paper should not touch the sides of the beaker. Cover the beaker with plastic wrap and leave the paper cylinder in the beaker until the solvent has nearly reached the top edge of the paper.

Remove the paper from the beaker. Spray the chromatogram with a fine, even layer of the ninhydrin then dry the chromatogram under a heat lamp. When they are still visible circle each spot. The colour may fade with time.

Observation Table :—

S.No.	Solvent	Distance travelled in (cm)
1	Amino acid A	12.5
2	Amino Acid B	3.0
3	Amino Acid B	4.7

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Result :- R_f value for the solution A
is 0.24 and for the solution B
is 0.37

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Object: — To determine the iodine value of an oil / fat.

Requirements: — Potassium dichromate, concentrated hydrochloric acid, potassium iodide solution — prepare a fresh solution by dissolving 10 g of KI free from potassium iodate in 90 ml of water, starch solution, standard sodium thiosulphate solution (0.1 N), Iodine Monochloride, Wijs iodine monochloride solution.

Principle: — The material is treated in carbon tetrachloride medium with a known excess of iodine monochloride solution in glacial acetic acid (Wijs solution). The excess of iodine monochloride is treated with potassium iodide and the liberated iodine estimated by titration with sodium thiosulphate solution.

Procedure: — Melt the sample if it is not already completely liquid and filter through a filter paper to remove any impurities and the last traces of moisture. Make sure that the sample as well as the glass apparatus used is absolutely clean and dry. weight accurately by difference an appropriate quantity of the oil or fat

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calculation

$$\text{Iodine value for (coconut oil)} = \frac{12.69(B-S) \times N}{W}$$

$$= \frac{12.69(30-17) \times 0.1}{2}$$

$$= \frac{12.69 \times 13 \times 0.1}{2}$$

$= 8.24$

calculation :—

$$\text{Iodine value} = \frac{12.69(B-S) \times N}{W}$$

where,

B → volume in ml of $\text{Na}_2\text{S}_2\text{O}_3$ solution required

S → volume in ml of $\text{Na}_2\text{S}_2\text{O}_3$ solution required for the blank

N → Normality of $\text{Na}_2\text{S}_2\text{O}_3$ solution and for the sample

W → weight in g. of the material taken for the test.

Result :— Iodine value of an oil
(coconut oil) is 8.24

Precautions :—

- ① As soon as Wijs solution is added stopper the flask immediately.
- ② Exactly for 30 minutes the flask should be kept in dark.
- ③ Exact and accurate weighing should be done according to the iodine value expected in the sample.