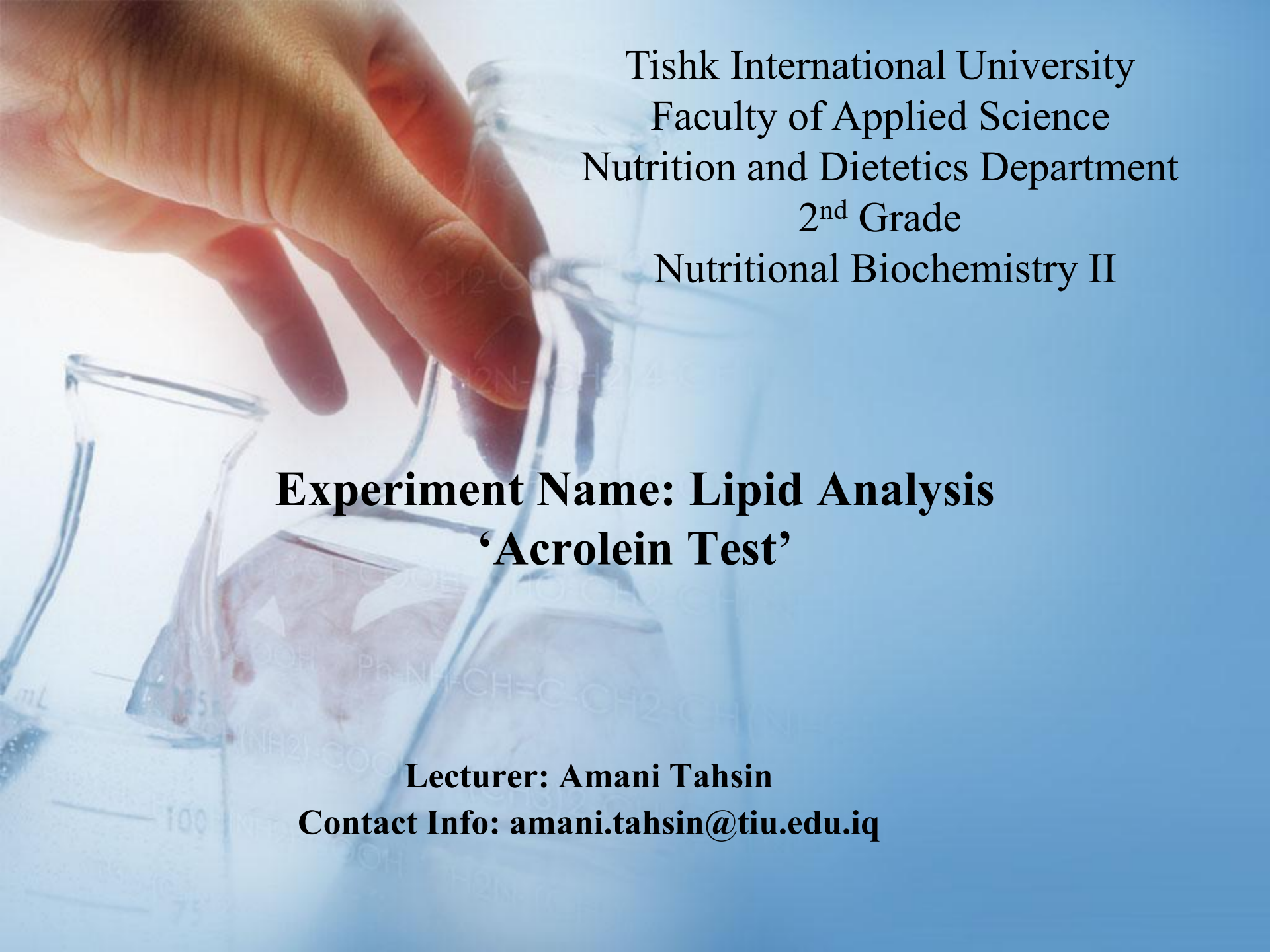

Tishk International University
Faculty of Applied Science
Nutrition and Dietetics Department
2nd Grade
Nutritional Biochemistry II

Experiment Name: Lipid Analysis 'Acrolein Test'

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Objectives

- Aim
- Principle of Reaction
- Laboratory Significance

Aim of the Experiment

- To detect the presence of glycerol-containing lipids.
- To understand the chemical basis of the acrolein test.
- To relate lipid structure to biochemical reactions.

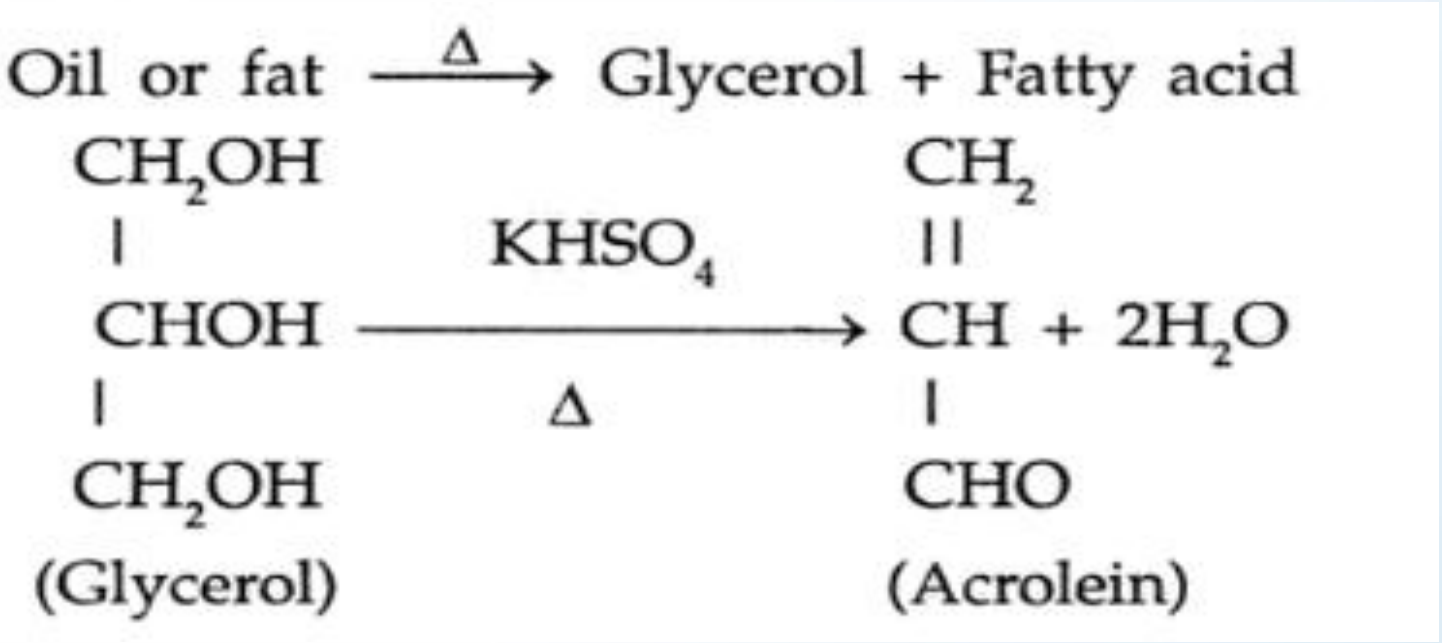
Principle of Experiment

- Acrolein test is used to detect the presence of glycerol and fat. This test is based on the dehydration reaction, in which the water molecules are removed from the glycerol by adding reagent potassium hydrogen sulphate.
- The reaction between glycerol and potassium hydrogen sulphate results in acrolein formation, which is characterized physically by the release of the pungent smell

Principle of the Acrolein Test

- The test detects glycerol released from triglycerides.
- On strong heating with potassium bisulfate ($KHSO_4$), glycerol dehydrates.
- Dehydration forms acrolein, an unsaturated aldehyde.

Biochemical Reaction



Reagents Required

- Lipid sample (oil or fat).
- Potassium bisulfate ($KHSO_4$).
- Test tube and heating source.

Method:

1.Take 1 ml of the lipid sample in a test tube.

2.Add crystals of potassium hydrogen sulphate.

3.Heat the solution for a few minutes.

4.Smell the test tube for the pungent smell.

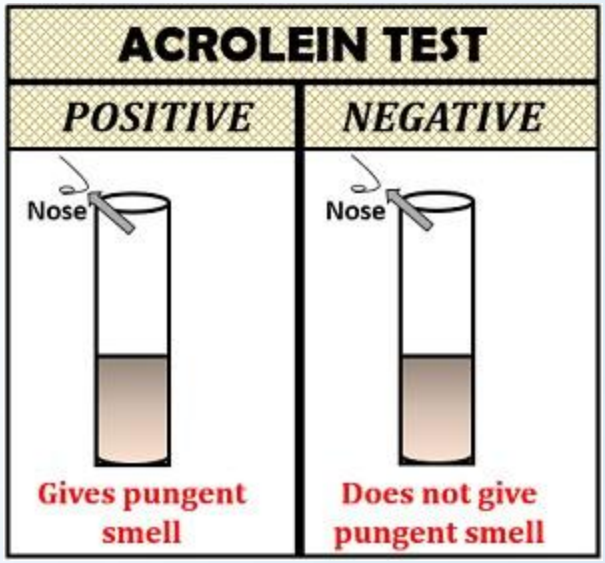
Observation

- Formation of a sharp, irritating smell.
- The odor resembles burnt fat.
- Indicates formation of acrolein.

Result and Interpretation

- Positive test indicates presence of glycerol, it will give a pungent smell.

- Confirms glyceride-type lipids.
- Negative result indicates absence of glycerol-based lipids, it will not produce a pungent smell.



Safety Precautions

- Perform the test in a fume hood.
- Avoid inhalation of acrolein vapors.
- Wear gloves and lab coat.

Biochemical Significance

- Demonstrates dehydration reactions in biochemistry.
- Helps identify lipid classes in biological samples.
- Links structure of lipids to chemical behavior.