

SEC-252-CHE-P: Clinical Chemistry Practical

Course Type: SEC (Practical)

No. of Credits: 2

Course Outcomes

At the end of the course, student will be able to

1. Recall the normal biochemical composition of urine and blood plasma, and the procedures used for their analysis.
2. Explain the principles and significance of biochemical tests such as colorimetry and titrimetry used in clinical diagnosis.
3. Perform standard biochemical tests on simulated blood and urine samples to analyze compounds such as creatinine, vitamin C, glucose, and cholesterol.
4. Differentiate between normal and abnormal biochemical test results to identify potential physiological conditions.
5. Assess the accuracy and reliability of biochemical test methods and their relevance in clinical diagnosis.
6. Design a complete workflow for biochemical analysis of a clinical sample, including sample preparation, test selection, execution, and reporting.

Course Contents

1. Visit to clinical lab to observe functioning in clinical lab / preparation of lab reports.
(Compulsory)
2. Table work/Visit to hospital: Urea and blood collection method and their preservation:
(Compulsory)

Body fluid analysis practical's: All practical described here should be performed on simulated laboratory samples which has same composition as urine / blood plasma.

- a) The typical composition of urine of normal person is 0.05% Ammonia, 0.18% sulfate, 0.12 %phosphate, 0.01% Mg, 0.015% calcium, 0.6% K, 0.1% Na, 0.1% creatinine, water soluble Vitamins, 2% urea. (For salts add NH_4SO_4 , Na_2HPO_4 , KCl , CaCl_2)*
- b) Typical blood plasma composition: 100 ml blood plasma contains approximately: glucose 80 to 140 mg (normal person), total proteins - 5 g, Calcium - 7 mg, phosphate - 11 mg, Mg - 1.5 mg, Na - 320 mg, potassium – 16 mg; Cl^- - 100 mg, vit-C - 0.5 to 2 mg, thiamine - 2.5 to 6 microgram, riboflavin - 3 to 19 microgram.*

etc. Thus, prepare simulated blood plasma sample by adding appropriate quantity of each constituents.

Any Ten Experiments from given list

1. Qualitative test for reducing sugars and proteins.
2. Physical observation of urine sample for its pH, colour, turbidity, etc.
3. Analysis of urea from urine sample by colorimetry.
4. Analysis of creatinine from urine sample by colorimetry.
5. Analysis of Vit-C from urine sample by titrimetric method.
6. Analysis of urine and blood glucose level by colorimetry.
7. Analysis of blood cholesterol level by colorimetry.
8. Calcium in blood.
9. Estimation bilirubin.
10. Estimation of total plasma proteins by Lowry Method.
11. Oral glucose tolerance test.
12. Estimation of chloride in urine.
13. Estimation of Sulphate in Urine

References

1. Clinical Chemistry A Laboratory Perspective, Wendy Arneson, Jean Brickell, F. A. Davis Company, 2007
2. Standard Methods of Clinical Chemistry Volume I By The American Association Of Clinical Chemists, Editor-in-Chief: Miriam Reiner, Academic Press New York, San Francisco, London, 1953
3. Basic Concepts in Clinical Biochemistry: A Practical Guide, Vijay Kumar • Kiran Dip Gill, Springer.