Jyoti Nivas College Autonomous
Hosur Road, Bangalore 560095
Department of Chemistry
Practical syllabus for B.Sc. Semester II

Chemistry II: Foundation of Chemistry II

Course Code: 24IICH2P **No. of Hours per week: 3**

Course Objectives:

This course aims to imparts to the students, knowledge of:

I. Understanding Core Concepts:

1. Fundamental understanding of key physical properties such as density, viscosity, surface tension, and distribution coefficients.

II. Analytical Skills:

1. Accurately measuring and analyzing physical properties using specialized equipment (e.g., specific gravity bottles, viscometers, stalagmometers) and techniques (e.g., viscosity, CST, distribution coefficient determination).

III. Practical Techniques:

2. Applying experimental methods to determine properties like density, viscosity, surface tension, critical solution temperature, and molar mass in various chemical contexts.

IV. Interpreting Data Effectively:

3. Analyzing and interpreting experimental data to understand the effects of concentration, solutes, and surfactants on physical properties and to evaluate the accuracy of measurements.

V. Critical Thinking:

4. Evaluating experimental results critically, understand the implications of findings in real-world scenarios, and assess the reliability and significance of different measurement techniques.

Course Outcomes:

After the completion of this course, the student would be able to:

I. Understand Core Concepts:

1. Gain a fundamental understanding of key physical properties such as density, viscosity,

surface tension, and distribution coefficients.

II. Develop Analytical Skills:

2. Accurately measure and analyze physical properties using specialized equipment (e.g., specific gravity bottles, viscometers, stalagmometers) and techniques (e.g., viscosity, CST, distribution coefficient determination).

III. Apply Practical Techniques:

3. Apply experimental methods to determine properties like density, viscosity, surface tension, critical solution temperature, and molar mass in various chemical contexts.

IV. Interpret Data Effectively:

4. Analyze and interpret experimental data to understand the effects of concentration, solutes, and surfactants on physical properties and to evaluate the accuracy of measurements.

V. Foster Critical Thinking:

5. Evaluate experimental results critically, understand the implications of findings in real-world scenarios, and assess the reliability and significance of different measurement techniques.

Experiments:

1. Determination of density using specific gravity bottle and viscosity of a liquid using Ostwald's viscometer.
2. Determination of density using specific gravity bottle and surface tension of a liquid using Stalagmometer.
3. To study the viscosity variation of sucrose solution with concentration of the solute.
4. Determination of percentage composition of a binary liquid mixture by viscosity method.
5. Determination of critical solution temperature of phenol-water system.
6. Determination of percentage of sodium chloride solution by finding out the CST of phenol-water system.
7. Determination of molar mass of a non-electrolyte by Walker-Lumsden method.
8. Determination of distribution coefficient of benzoic acid between water and toluene.
9. Determination of distribution coefficient of acetic acid between water and butanol.
10. To study the effect of surfactants on the surface tension of water (Stock solution to be given).

References: Recommended Books

1. Senior Practical Physical Chemistry by B. C. Kosla, Simla Printers New Delhi (1987)
2. Experimental Physical Chemistry by Daniel et al., McGraw Hill, New York (1962).
3. Practical Physical Chemistry by A.M James and P. E. Pritchard, Longman's Group Ltd (1968).
4. Experimental Physical Chemistry by Wilson, Newcombe & others, Pergamon Press, New York (1962)
5. Experimental Physical Chemistry by R. C. Behra and B Behra, Tata McGraw, New Delhi (1983)
6. Experimental Physical Chemistry by V. D. Atavale and Parul Mathur, New Age International, New York (2001)
7. Physical Chemistry Laboratory Principles and Experiments by H. W. Salberg J. I. Morrow, S. R. Cohen and M. E. Green Macmillan publishing Co. New York. Delhi (2006).