

20CY112 PHYSICAL CHEMISTRY LAB - 2

Hours Per Week :

L	T	P	C
-	-	4	2

Course Description and Objectives:

This lab course aims to provide opportunities to the students to understand the fundamental concepts in Physical Chemistry through various experiments. This course will allow the students to utilize the concepts learned in their Physical Chemistry theory class to calculate/determine several important properties of chemical systems. These labs are also designed to be in-sync with the topics covered in the theory classes.

Course Outcomes :

Upon completion of the course, the student will be able to achieve the following outcomes:

COs	Course Outcomes
1.	Apply the concept of electrochemistry to calculate various electrochemical parameters.
2.	Use concepts of phase equilibrium to study various binary and ternary systems.
3.	Recognize the difference between various adsorption isotherms through experiments.
4.	Identify the parameters affecting the various surface properties of different chemical systems.
5.	Evaluate various kinetic parameters of chemical systems by different instrumentation techniques.

1. Estimation of thermodynamic functions from EMF data
2. Study of the reversibility of redox process using cyclic voltammetry
3. Study of phase diagram of phenol-water system
4. Determination of % composition of NaCl in a solution using phenol-water system by CST method
5. Determination of Freundlich and Langmuir constants using activated charcoal
6. Determination of surface tension of given liquid using stalagmometer by drop count method
7. Determination of CMC of a micelle from Surface Tension Measurement
8. Study of viscosity of unknown liquid (glycerol, sugar) with respect to water
9. Study of the variation of viscosity with the concentration of the solution
10. Determination of the indicator constant of an acid base indicator spectrophotometrically
11. Verification of Beer and Lambert's law for KMnO_4 and $\text{K}_2\text{Cr}_2\text{O}_7$ solution
12. Study of kinetics of $\text{K}_2\text{S}_2\text{O}_8 + \text{KI}$ reaction, spectrophotometrically
13. Determination of pH of unknown buffer, spectrophotometrically
14. Kinetic study of inversion of cane sugar using a Polarimeter (Preferably Digital)

Text Books:

1. Viswanathan, B., Raghavan, P.S. Practical Physical Chemistry Viva Books (2009)
2. Levitt, B. P. edited Findlay's Practical Physical Chemistry Longman Group Ltd.
3. Mendham, J., A. I. Vogel's Quantitative Chemical Analysis 6th Ed., Pearson.