

MSC-513P					Physical Chemistry-I Lab					
Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs/Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
0	0	3	1.5	3				50	50	100

**COURSE OBJECTIVES**

- To familiarize with the concept of chemical kinetics and rate law concept.
- To comprehend the factors affecting rate of reaction
- To use the methods of science, in which quantitative, analytical reasoning techniques are used.
- To learn about the properties of polymers and solutions.

**LIST OF EXPERIMENTS**

1. To study the kinetics of ester hydrolysis by acid and base;
2. Determine the order and specific reaction rate of the potassium persulphate-iodide reaction by initial rate method
3. To study primary salt effects in oxidation of iodide ion by persulphate ion.
4. To compare the strengths of two acids by studying acid-catalyzed hydrolysis of an ester.
5. To study the kinetics of iodination of acetone in the presence of acid by initial rate method.
6. Determination of Energy of activation for acid catalyzed hydrolysis of methyl acetate.
7. Polarimetric determination of Concentration of unknown sugar solution
8. To study the kinetics of inversion of cane sugar by optical rotation measurement.
9. Determination of relative strength of acids using reaction kinetics of inversion of cane sugar by polarimetry.
10. To study the iodination of acetone using a colorimeter
11. Partition coefficient of  $\text{NH}_3$  between water and chloroform/ benzoic acid between benzene and water
12. Determination of partition coefficient and equilibrium constant for  $\text{KI} + \text{I}_2 \rightarrow \text{KI}_3$  by solubility product or partition method.
13. Adsorption of oxalic acid and acetic acid on activated charcoal.
14. Study of chain linkages in PVA and its molecular weight determination by viscometry.
15. Determination of partial molar volume of NaCl.

**COURSE OUTCOMES**

On completion of the course, student will be able to

- CO1– Explain and apply concepts of chemical kinetics  
 CO2– Apply the scientific process in the design, conduct, evaluation and reporting of experimental investigations  
 CO3– Demonstrate the effect of various factors on rate of chemical reaction and its kinetics  
 CO4– Derive and construct rate equations from mechanistic data and evaluate reaction mechanisms  
 CO5– Understand the surface phenomenon of adsorption,  
 CO6– Comprehend the molecular properties of polymers and solutions

**TEXT/REFERENCE BOOKS**

1. J.B.Yadav, *Advanced Practical Physical Chemistry*, Goel Publications, Meerut, 2003.
2. A. I. Vogel, *Fundamentals of Quantitative Analysis*, 5<sup>th</sup> Ed., Addison Wesley longman., 1989.
3. G. Suehla, *Vogel's Qualitative Inorganic Analysis*, 6<sup>th</sup> Ed., Orient Longman, 1989
4. P. Samnani, *Experiments in Chemistry*, Anmol Publications, New Delhi 2007

**SEMESTER EXAMINATION PATTERN****Max. Marks: 100**

LW(Daily lab performance plus journal maintain each 25 marks)  
 LE (Viva-voce plus Lab examination each 25 marks)

**Exam Duration: 3 Hrs**

50 Marks  
 50 Marks