SIDDAGANGA INSTITUTE OF TECHNOLOGY, TUMKUR-572 103.
(An Autonomous Institution affiliated to VTU, Belgaum)

Syllabus from the academic year 2019-20 onwards
IV Sem. B.E. (Chemical)
Subject: TECHNICAL CHEMISTRY LAB

Contact Hours/Week	:	3	Credits	:	1.5
			CIE Marks	:	50
Course Code	:	4 CHL3	SEE Marks	:	50

Identification and Estimation of physical parameters

1. Estimation of alcohol by acetylation.
2. Estimation of phenol by bromination.
3. Estimation of carboxylic acid by iodometric titration.
4. Estimation of esters by hydrolysis.
5. Partition coefficient - Determination of partition coefficient of iodine between water and carbon tetrachloride.
6. Reaction Kinetics- Study of kinetics of the reaction between $K_2S_2O_8$ and KI.
7. Viscometry- Determination of percentage composition of binary mixture using Ostwald's viscometer.
8. Thermodynamics - Critical point - Effect of salt on the critical solution temperature of phenol-water system.
9. Determination of transition temperature of the given salt hydrate.
10. Determination of iron as ferric oxide gravimetrically (after separating Barium) in the given Barium Ferrite ore solution.
11. Fourier transform infrared spectroscopy (**FTIR)** - Detection of functional groups in the given sample (Demonstration of the experiment)
12. X-ray diffraction **(XRD)** technique for materials characterization – (Demonstration of the experiment)

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Reference:

1. Arthur I. Vogel, Quantitative Inorganic Analysis and Elementary Instrumental Analysis, ELBS, Longmann Group, 5th Edition, 1989.

Course Learning Objectives (CLO): (Based on Bloom's Taxonomy)

CO1: To guide students to estimate alcohol by acetylation, phenol by bromination, carboxylic acid by iodometric titration and esters by hydrolysis

CO2: To educate and guide the students to determine partition coefficient of iodine between water and carbon tetrachloride and study of kinetics of the reaction between $K_2S_2O_8$ and KI.

CO3: To teach students to use Viscometry for the determination of percentage composition of binary mixture.

CO4: To explain the determination of Critical point, effect of salt on the critical solution temperature of phenol-water system and determination of transition temperature of the given salt hydrate.

CO5: To train the students in gravimetric analysis and to use these techniques for determination of iron as ferric oxide gravimetrically in the given Barium Ferrite ore solution

Course Outcomes (COs):

On successful completion of this course, the student will be able to:

1. Estimate alcohol by acetylation, phenol by bromination, carboxylic acid by iodometric titration and esters by hydrolysis.
2. Determine partition coefficient of iodine between water and carbon tetrachloride and study of kinetics of the reaction between $K_2S_2O_8$ and KI.
3. Use Viscometer for the determination of percentage composition of binary mixture.
4. Find the critical point for phenol water system and transition temperature of the given salt hydrate.
5. Develop the use of knowledge in gravimetric analysis for the estimation of iron as ferric oxide gravimetrically in the given Barium Ferrite ore solution.

Mapping of Course Outcomes with Program outcomes

1. Ability to apply knowledge of science to the engineering problems.

2. Ability to analyze the problems using the principles of science.

Program Articulation Matrix:

	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	√											
CO2		√										
CO3		√										
CO4	√											
CO5	√											

Course Articulation Matrix:

	Pos											
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	1											
CO2	2											
CO3	2											
CO4	1											
CO5	2											

[1]High association, [2]Moderate association, [3]Low association