OC P 469: PHYSICAL CHEMISTRY PRACTICALS-II

(At least 12 experiments are to be carried out)

Course Outcome

- In continuation with the practical course introduced in the first semester, this course provides opportunity to students to test the concepts learnt in the basic physical chemistry course OC H 403. Experiments have been designed on thermodynamics, kinetics, surface and interface chemistry.
- With the training gained, students will be able to handle issues related to metallurgical processes, waste water treatment, energy efficient processes, action of soaps and detergents etc.
- Students will also be introduced to the use of few software packages useful to chemists.

1. Determination of cryoscopic constants of solvents and molecular weight of non-volatile substances by thermal method.
2. Heat of solution of a sparingly soluble compound in water by solubility method.
3. Phase diagram of two component systems by thermal analysis.
4. Phase diagram of three component system (a) 3 liquids with single binodal curve, and b) two liquids and one solid
5. Kinetics of acid catalyzed hydrolysis of methyl acetate and determination of Energy of activation.
6. Determination of a) Energy of activation & b) rate constant for the First and second order kinetics of reaction between potassium persulphate and potassium iodide.
7. Kinetics of sodium formate-iodine reaction.
8. Verification of Freundlich and Langmuir adsorption isotherms for acetic acid on activated charcoal.
9. Comparison of detergent action of detergents and determination of interfacial tension.
10. Study of association of benzoic acid in benzene/toluene and determination of partition coefficient.
11. Determination of partial molar volumes of (a) Salt - water and (b) alcohol - water (methanol and ethanol) systems by density method.
12. Computers in Chemistry-Use of softwares to make linear plots and calculate constants from slope and intercepts
13. Computers in Chemistry- Drawing structures using chem draw/chem sketch

Any other relevant experiments of interest.

References

1. Findlay's Practical Physical Chemistry, Alexander Findlay and B. P. Levitt, Prentice Hall Press (1973).
2. Practical Physical Chemistry, 3rd edn., A. M. James and F. E. Prichard, Longman Publication (1974).
3. Experimental Physical Chemistry, 7th edn., D. Farrington, M. J. Howard and W. J. Warren, McGraw Hill College (1970).
4. Experimental Physical Chemistry, R. C. Das and B. Behera, Tata McGraw Hill, New Delhi (1983).
5. Advanced Practical Physical Chemistry, J. B. Yadav, Krishnaprakashan Media Publication (2016).
6. Experiments in Physical Chemistry, J. C. Ghosh, Bharathi Bhavan, New Delhi (1974).
8. Practical Physical Chemistry, B. Viswanathan and P. S. Raghavan, ViVa Books, New Delhi (2017).