

CA P 468: PHYSICAL CHEMISTRY PRACTICALS

(Any 12 experiments are to be carried out)

Course Outcomes

- Experiments have been designed which make use of the concepts of electrochemistry, thermodynamics, solution chemistry and surface chemistry.
- Students get hands on experience in use of various instruments and will be able to test the theoretical concepts.

- Determination of transport number of Cd^{2+} and SO_4^{2-} ions by EMF method.
- Determination of thermodynamic parameters of a cell reaction by EMF method.
- Determination of pK values phosphoric acid by potentiometric/pH metric method.
- Potentiometric titration of halides in mixtures (Cl^- , Br^- and I^-) with silver nitrate.
- Verification of Nernst equation for Ag^+ , Cu^{2+} and Zn^{2+} species.
- Determination of Solubility product and the Instability constant by potentiometric method.
- Potentiometric determination of solubility of insoluble silver halide and the standard electrode potential using quinhydrone electrode.
- Conductometric titrations of displacement and precipitation reactions.
- Determination of equivalent conductance and dissociation constants of weak acid and base.
- Determination of solubility of lead iodide at different T & hence molar heat of solution
- Determination of hydrolysis constant of aniline hydrochloride.
- Determination of degree of hydrolysis of $\text{CH}_3\text{CO}_2\text{Na}$ and NH_4Cl by conductivity method.
- Determination of pH of buffer solutions with a pH meter and evaluation of pK_a of acids
- Verification of Walden's rule (relation between viscosity of a solution and the electrical conductivity).
- Study of variation of viscosity of a liquid with temperature.
- Determination of parachor value for CH_2 group and some elements by Surface Tension Method.
- Determination of the composition of a solution by S.T measurements.
- Determination of the Critical Micelle Concentration by surface tension/conductometric measurements.
- Determination of specific and molar refractivity of liquids and parachor value of a species by refractometric method.

Any other relevant experiments of interest.

References

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- Experimental Physical Chemistry, 7th edn., F. Daniels, Tata McGraw Hill (1970).
- Experimental Physical Chemistry, R. C. Das and B. Behera, Tata McGraw Hill, New Delhi (1983).
- Advanced Practical Physical Chemistry, J. B. Yadav, Krishnaprakashan Media Publication (2016).
- Experiments in Physical Chemistry, J. C. Ghosh, Bharathi Bhavan, New Delhi (1974).
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