

Paper – II CHN-602(P) Physical Chemistry

Unit :- 1

- The Phenomena and Mechanism of Electrolysis : The electrolytic Dissolution Theory (Ionic theory) Influence of solvent on dissolution.
- Electrolytic Conductance : Conductance ratio, Equivalent conductance minima, Equivalent Conductance at Infinite dilution, Independence migration of ions, Ionic mobility, Experimental determination of ionic mobility, Factors effecting ionic mobilities, abnormal ion conductances.
- Mechanism of electrolytic conductance (Debye Huckel Onsagar conductance equation) validity of DHO Equation (Aqueous & non aqueous solution), Deviation of DHO Equation, Debye Falkenhagen effect and Wein effect.
- Transference number (True, Apparent & Abnormal), Transference numbers in mixture, Factors effecting transference numbers, Methods for determining transference numbers.

Unit :- 2

- Acids and Bases : Types of solvents, Dissociation constant, Determination of dissociation constants of mono and Poly basic acids by E.M.F. methods, colorimetric methods and conductimetric methods,
- Effect of solvent on dissociation constant, Determination of ionic product of water by conductometric method and E.M.F. method.
- Amphoteric Electrolytes : Properties of Dipolar ions, E.M.F. methods for determination of dissociation constant of amino acids, Proporation of Dipolar ions, Isoelectric point.
- Neutralization curves for ampholytes, Activity coefficient of ampholytes.

Unit :- 3

- Overvoltage : Theories of Hydrogen Overvoltage (Bubble formation, Combination of atoms as slow process, Ion Discharge as the slow process, Proton transfer as the slow process), Factors effecting Overvoltage, Oxygen overvoltage, Hydrogen overvoltage.
- Polarisation : Electrolytic polarization, Disolution and decomposition potentials, metal deposition, Concentration polarization, Decomposotion voltage in auccous solutions, Metal dissolution.
- Reversible Oxidation and Reduction : Reversible Oxidation and reduction process, Non Reversible process, Factors effecting electrolytic reduction and electrolytic Oxidation, Appliction of electrolytic oxidation and reduction (polymerization of anions, Oxidation of Fatty acids, Brown-walker Electro synthesis.

Unit :- 4

- Electrokinetic Phenomena: Electro Osmosis, Streaming potential, Electrophoresis, Determination of Zeta potentials, Influence of Zeta potentials of ions on Electrokinetic phenomena, Electrophoretic mobility and Bond Hydrogen ion.
- Quantum aspects of charge transfer : quantum aspects of charge transfer reaction or electrode solution interface, mechanics of electron, penetration of electrons into classically forbidden regions, Probability of electron tunneling through barriers, Tunneling condition and Proton transfer curve, De-electrons, reaction. A symmetry Factor B.