

CY-303 REACTION KINETICS

Introduction and Scope of Chemical Kinetics: Experimental techniques for the determination of reaction rate, real time analysis, quenching method, flow method, stopped flow technique, flash photolysis, and electrochemical analysis, Factors affecting the rate of chemical reaction, Order and molecularity, Kinetics' of Zero order reaction, first order reaction, second reaction order (with same initial and different initial concentration), and pseudo order reactions, Half -life for various order reactions, Methods for the determination of order of reactions, The collision Theory, The Transition State Theory, The Arrhenius Theory, Activation parameters. The kinetics and mechanism of complex reactions: chain reaction, polymerization, catalysis and oscillation.

Third and higher order reactions: Deduction of third order reactions with same and different initial concentrations of the reactants, Rate expression of $2A+B$ Products, Relation between rate equations for the forward and backward reactions, Reversible first order reactions, Consecutive first order reaction, Effect of temperature on rate constant and equilibrium constant, frequency factor, Concept of steric and energy factor, Arrhenius parameters for bimolecular reactions. Metathesis reactions not involving atoms, Association reactions of radicals, Hinshelwood theory of unimolecular reaction, Bimolecular collision theory, Trimolecular reactions, Branched and unbranched chain reactions.

Influence of ionic strength on the reaction rate. Reactions in solutions, Effect of dielectric constant of the medium on the rate of the reaction. Single sphere activated complex model. Double sphere activated complex model, Complex reactions, Chain reactions, Single chain carrier with second order breaking, One chain carrier with first order breaking. Two chain carrier with second order breaking, Experimental techniques for fast reactions.