C402: Chemical Rate Processes

Kinetic Measurements
General features of fast reactions; study of fast reactions by flow techniques, relaxation methods (T-Jump, P-Jump, ultrasonic, pulse radiolysis, NMR); flash photolysis; salt and solvent effects on reactions in solutions. (5)

Chain Reactions: Features of chain reactions; thermal and photochemical reactions (hydrogen-bromine reaction, decomposition of aldehydes and ketones). (5)

Kinetics of oscillatory reactions: Introduction to oscillatory reactions; Belousov-Zhabotinsky and Field-Koros-Noyes models. (4)

Rate Theory: Concept of potential energy surfaces, transition state theory including its statistical mechanical treatment, Phenomenological theories of unimolecular reactions (Lindemann, Hinshelwood), statistical mechanical theories of unimolecular reactions (RRKM). (10)

Reaction Dynamics: Collision theory and Reaction Dynamics, Reaction Cross section and rate constant, Brief idea of Molecular Beam Scattering, Dynamics in condensed phase. (10)

Femtochemistry: Concepts and perspectives; applications to studies of dynamics and control of chemical reactions. (6)

Recommended Books

Reference Books