

CY-503 CHEMICAL THERMODYNAMICS

Laws of Thermodynamics: Thermodynamic relationships, Fluid Dynamics of heat transfer, Joule–Thompson effect, thermochemistry, Entropy, Clausius and Kelvin formulation of entropy, Maxwell relations, development of equation of state.

Chemical Equilibrium: Thermodynamic equilibrium calculations, response of equilibrium to pressure, volume and temperature change, Gibbs free energy change and equilibrium constant, evaluation of equilibrium and conversions, thermodynamics of phase equilibria, Duhem equation, chemical potential, activity coefficient, fugacity and fugacity coefficient, excess Gibbs free energy, phase equilibrium at low to moderate pressure, Ideal and Non-Ideal solutions, residual and excess property relation, property changes of mixing, heat effects of mixing, Vapour-Liquid Equilibria (VLE) with cubic equation of state, mixing rules, liquid models using UNIFAC and UNIQUAC, phase rule and Duhem Theorem for reaction systems, thermodynamic functions from cell potential measurements.

Statistical Thermodynamics.