

NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Chemistry and Biochemistry - NOC:Chemical and Biological Thermodynamics: Principles to A

Subject Co-ordinator - Prof. Nand Kishore

Co-ordinating Institute - IIT - Bombay

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Fundamentals of Chemical thermodynamics
- Lecture 2 - Work
- Lecture 3 - Tutorial-1
- Lecture 4 - First Law of Thermodynamics
- Lecture 5 - Tutorial-2
- Lecture 6 - Adiabatic processes
- Lecture 7 - Entropy
- Lecture 8 - Entropy and Second Law
- Lecture 9 - Entropy and Second Law
- Lecture 10 - Third Law of Thermodynamics
- Lecture 11 - Discussion on Helmholtz energy
- Lecture 12 - Discussion on Gibbs Energy
- Lecture 13 - Maxwell relations, Properties of Gibbs energy
- Lecture 14 - Further discussion on properties of Gibbs energy
- Lecture 15 - Fugacity
- Lecture 16 - Tutorial session
- Lecture 17 - Tutorial session
- Lecture 18 - Chemical potential of a substance in mixture
- Lecture 19 - Chemical potential of Liquids, Raoult's Law, Henry's Law
- Lecture 20 - Thermodynamics of mixing, Excess functions
- Lecture 21 - Partial molar volume
- Lecture 22 - Activities (Accounting for deviations from Ideal behaviour)
- Lecture 23 - Tutorial on thermodynamics of mixing and deviations from ideality
- Lecture 24 - Further discussion on relation between C_p and C_v
- Lecture 25 - Chemical Equilibrium
- Lecture 26 - Perfect gas equilibria
- Lecture 27 - Equilibrium constant
- Lecture 28 - Effect of pressure on equilibrium constant and equilibrium composition
- Lecture 29 - Effect of temperature on equilibria

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- Lecture 30 - Biological standard states and pH
- Lecture 31 - Tutorial 1 - Equilibrium constant
- Lecture 32 - Tutorial 2 - Equilibrium constant
- Lecture 33 - Acids and bases and Equilibrium concepts
- Lecture 34 - pH Scale Strong and weak acids and bases
- Lecture 35 - Strong and weak acids and bases
- Lecture 36 - Acid-base titrations
- Lecture 37 - pH curve for titration of weak acid with strong base Buffers and indicators
- Lecture 38 - Thermodynamics in systems of biological interest
- Lecture 39 - Calorimetry
- Lecture 40 - Differential scanning calorimetry (DSC)
- Lecture 41 - Further discussion on Differential Scanning Calorimetry (DSC)
- Lecture 42 - Explaining Differential Scanning Calorimetric Profiles (DSC Profiles)
- Lecture 43 - Applications of DSC in thermal unfolding of proteins and protein-solvent interactions
- Lecture 44 - Further discussion on applications of DSC in thermal unfolding of proteins and protein-solvent i
- Lecture 45 - Isothermal Titration calorimetry (ITC)
- Lecture 46 - Further discussion on Isothermal Titration calorimetry (ITC)
- Lecture 47 - ITC Experimental Design and Isothermal Titration Calorimetry (ITC) in Drug Design
- Lecture 48 - Isothermal Titration Calorimetry (ITC) in Drug Design
- Lecture 49 - Isothermal Titration Calorimetry (ITC) in Engineering Binding Affinity
- Lecture 50 - Calorimetry in identifying partially folded states of proteins (Molten Globule State)
- Lecture 51 - Thermodynamic Characterization of Partially Folded States of Proteins
- Lecture 52 - Quantitative Thermodynamic Characterization of Partially Folded States of Proteins
- Lecture 53 - ITC in Drug-Protein Interactions
- Lecture 54 - Identifying sites for Drug-Protein Interactions by ITC
- Lecture 55 - Identifying sites for Drug-Protein Interactions, DSC of Protein-Ligand Complexes. Enthalpy-Entro
- Lecture 56 - Estimation of Binding Constants in Strong to Ultratight Protein-Ligand, Interactions Using Diffe
- Lecture 57 - Continuation of discussion on... Estimation of Binding Constants in Strong to UltratightProtein-
- Lecture 58 - Thermal unfolding of protein by non-calorimetric methods, Addressing thermodynamics of the proce
- Lecture 59 - Titration Calorimetry as a tool to determine thermodynamic and Kinetic parameters of enzymes
- Lecture 60 - Summary of the course on