NPTEL Video Course - Biotechnology - Thermodynamics

Subject Co-ordinator - Prof. G.K. Suraishkumar

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introduction and Review
Lecture 2 - Need for Analysis Additional Thermodynamic Functions State and Path Variables
Lecture 3 - Equations for a Closed system Chemical Potential Concept Gibbs-Duhem Equation
Lecture 4 - Maxwellâ s relations
Lecture 5 - Inter-Relationships between Thermodynamic Variables
Lecture 6 - Some Useful Mathematical Manipulations
Lecture 7 - Thermodynamic Relations for a Closed System with 1 mole of a pure Substances
Lecture 8 - Maximum Work,Lost Work Review of Closed Systems
Lecture 9 - Open Systems
Lecture 10 - Equations of State - Virial Equations
Lecture 11 - Equations of State - Cubic Equations
Lecture 12 - Volume Estimation
Lecture 13 - Volume Estimation (Continued...) Generalized correlations
Lecture 14 - Generalized correlations (Continued...) Residual Properties
Lecture 15 - Residual Properties (Continued...)
Lecture 16 - Generalized Correlations and Residual Properties
Lecture 17 - Fugacity Coefficient Estimation
Lecture 18 - Review of Module 3
Lecture 19 - Learning Aspects Chemical Potential Formulations
Lecture 20 - Lewis and Randall rule partial Molar Properties
Lecture 21 - Partial Molar Property Estimation from Mixing Experiments
Lecture 22 - Partial Molar Property Estimation (Continued...) Excess Property
Lecture 23 - Activity Coefficient from Excess Property
Lecture 24 - Activity Coefficient from Excess Property (Continued...)
Lecture 25 - Activity Coefficient from Excess Property (Continued...) Models for Activity Coefficient in Bina
Lecture 26 - Models for Activity Coefficient in Binary Systems (Continued...)
Lecture 27 - Review of Module 4
Lecture 28 - Criteria for Phase Equilibrium Phase Rule for Non-reacting Biosystems
Lecture 29 - Clausius - Clayperon Equation

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Lecture 30 - Clausius - Clayperon Equation (Continued...) vapour-Liquid Equilibrium
Lecture 31 - Vapour-Liquid Equilibrium (Continued...) Estimation of Fugacity coefficient from Equilibrium P-V
Lecture 32 - Liquid/Liquid and Solid/Liquid Equilibria
Lecture 33 - Review of Module 5
Lecture 34 - Criteria for Bio-reaction Equilibria
Lecture 35 - Phase rule for Reacting Biosystems Equilibrium constants
Lecture 36 - Effect of Temperature and Pressure on the Equilibrium constants
Lecture 37 - Reaction in Liquid or Solid Phases
Lecture 38 - Free energy Changes for some Bioreactions
Lecture 39 - Electrolytes
Lecture 40 - Course Review

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