NPTEL Video Course - Chemistry and Biochemistry - NOC:Chemical Principles-II

Subject Co-ordinator - Prof. Arnab Mukherjee

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introduction to The Thermodynamics
Lecture 2 - History of Thermodynamic
Lecture 3 - Thermodynamic Systems and Variables
Lecture 4 - Zeroth Law of Thermodynamic
Lecture 5 - Microscopic Definition of Temperature - Part 1
Lecture 6 - Microscopic Definition of Temperature - Part 2
Lecture 7 - Different Forms of Energy
Lecture 8 - Real Gas and Virial Equation
Lecture 9 - Van der Waals Gas
Lecture 10 - Work and Heat - Part 1
Lecture 11 - Work and Heat - Part 2
Lecture 12 - First Law of Thermodynamics
Lecture 13 - Microscopic Definition of Heat and Work
Lecture 14 - Work done at a Constant Temperature
Lecture 15 - Heat is a path function
Lecture 16 - Joule-Thomson Effect (For Ideal Gases)
Lecture 17 - Joule-Thomson Effect (For Van der Waals gas)
Lecture 18 - Adiabatic Reversible Work
Lecture 19 - Adiabatic Irreversible Work
Lecture 20 - Tutorial Problem - 1
Lecture 21 - Tutorial Problem - 2
Lecture 22 - Thermochemistry - Part 1
Lecture 23 - Thermochemistry - Part 2
Lecture 24 - Second Law of Thermodynamics
Lecture 25 - Statements of the Second Law of Thermodynamics
Lecture 26 - Carnot Cycle and Definition of Entropy
Lecture 27 - Ideal Stirling Engine
Lecture 28 - Gasoline Engine and Diesel Engine
Lecture 29 - CarnotÃ¢â ¬â ¢ Cycle

Lecture 30 - Thermodynamic Temperature
Lecture 31 - Definition of Entropy
Lecture 32 - Tutorial Problem - 3
Lecture 33 - Tutorial Problem - 4
Lecture 34 - Tutorial Problem - 5
Lecture 35 - Tutorial Problem - 6
Lecture 36 - Tutorial Problem - 7
Lecture 37 - Tutorial Problem - 8
Lecture 38 - Statistical Formulation of the Second Law
Lecture 39 - Probability
Lecture 40 - Microstates and Distributions
Lecture 41 - Permutation and Combination
Lecture 42 - Two-Level Systems
Lecture 43 - Most Probable Distribution
Lecture 44 - Calculation with Multi-Level systems
Lecture 45 - Calculation with Multi-Level systems with fixed energy - Part 1
Lecture 46 - Calculation with Multi-Level systems with fixed energy - Part 2
Lecture 47 - Calculation with Multi-Level systems with fixed energy - Part 3
Lecture 48 - Bose-Einstein, Fermi-Dirac and Maxwell-Boltzmann distribution
Lecture 49 - Most Probable Distribution is the Boltzmann Distribution
Lecture 50 - Demonstration of Boltzmann Distribution
Lecture 51 - Estimating Entropy for Various Processes
Lecture 52 - Microscopic equivalent of Heat and Work
Lecture 53 - Probability and Boltzmann Distribution
Lecture 54 - Thermodynamic Observables
Lecture 55 - Tutorial Problem - 9
Lecture 56 - Tutorial Problem - 10
Lecture 57 - Tutorial Problem - 11
Lecture 58 - Tutorial Problem - 12
Lecture 59 - Thermodynamic free energy
Lecture 60 - Condition for Spontaneity
Lecture 61 - Legendre Transformation of Thermodynamic Potentials
Lecture 62 - Maxwell Relations and Applications
Lecture 63 - Thermodynamic Relations using Jacobian Method - Part 1
Lecture 64 - Thermodynamic Relations using Jacobian Method - Part 2
Lecture 65 - Tutorial Problem - 13
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Lecture 67 - Tutorial Problem - 15
Lecture 68 - Tutorial Problem - 16

Lecture 69 - Chemical Principle II - Overview and Road Ahead