

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

NPTEL Video Course - Chemistry and Biochemistry - NOC:Fundamentals of Statistical Thermodynamics

Subject Co-ordinator - Prof. Nand Kishore

Co-ordinating Institute - IIT - Bombay

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

- Lecture 1 - General introduction to Statistical Thermodynamics
- Lecture 2 - Configuration and Weights
- Lecture 3 - Configuration and Weights (Continued...)
- Lecture 4 - Boltzmann Distribution
- Lecture 5 - The Molecular Partition Function
- Lecture 6 - The Molecular Partition Function of a uniform ladder of energy levels
- Lecture 7 - The partition function for a particle of mass  $m$  free to move in a 1D container
- Lecture 8 - The partition function for a particle of mass  $m$  free to move in a 3D container
- Lecture 9 - Numerical Problems Set-I (based on partition function)
- Lecture 10 - Numerical Problems Set-II
- Lecture 11 - The Internal Energy
- Lecture 12 - Obtaining expression for  $\beta$
- Lecture 13 - The Statistical Entropy
- Lecture 14 - Connecting partition function with entropy
- Lecture 15 - Solving numerical problems based on Internal energy and Entropy
- Lecture 16 - Solving numerical problems based on Internal energy and Entropy
- Lecture 17 - Negative Temperature
- Lecture 18 - Further discussion on  $q$  (Partition function),  $U$  (Internal energy) and  $S$  (Entropy)
- Lecture 19 - The Canonical Partition Function
- Lecture 20 - Relating Canonical Partition Function Internal Energy and Entropy
- Lecture 21 - Recovering molecular partition function  $q$  from canonical partition function  $Q$
- Lecture 22 - Entropy of a monatomic gas
- Lecture 23 - Further discussion on entropy of a monatomic gas - I
- Lecture 24 - Further discussion on entropy of a monatomic gas - II
- Lecture 25 - The Thermodynamic Functions (Pressure)
- Lecture 26 - The Thermodynamic Functions (Enthalpy)
- Lecture 27 - The Thermodynamic Functions (The Gibbs Energy)
- Lecture 28 - The Thermodynamic Functions (The Molecular Partition Function)
- Lecture 29 - The Rotational Contribution to Molecular Partition Function

---

Get DIGIMAT For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

<http://www.digimat.in>

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

---

- Lecture 30 - The Rotational Contribution to Molecular Partition Function (Nonlinear Rotor)
- Lecture 31 - The Rotational Contribution to Molecular Partition Function
- Lecture 32 - Rotational Partition Function
- Lecture 33 - Vibrational Partition Function - I
- Lecture 34 - Vibrational Partition Function - II
- Lecture 35 - Vibrational Partition Function - Applications
- Lecture 36 - Electronic Partition Function
- Lecture 37 - Mean Energies
- Lecture 38 - Mean Energies (Continued...)
- Lecture 39 - Heat Capacity
- Lecture 40 - Heat Capacity (Continued...)
- Lecture 41 - Mean Energies (Applications)
- Lecture 42 - Problem Solving
- Lecture 43 - Residual Entropy
- Lecture 44 - Residual Entropy (Continued...)
- Lecture 45 - Relation between equilibrium constant  $K$  and partition function  $q$
- Lecture 46 - Relation between equilibrium constant  $K$  and partition function  $q$  (Continued...)
- Lecture 47 - Relation between equilibrium constant  $K$  and partition function  $q$  (Applications-1)
- Lecture 48 - Relation between equilibrium constant  $K$  and partition function  $q$  (Applications-2)
- Lecture 49 - Contributions to equilibrium constant
- Lecture 50 - Contributions to equilibrium constant (Continued...)
- Lecture 51 - Contributions to equilibrium constant (Continued...) and Problems Solving
- Lecture 52 - Problem Solving
- Lecture 53 - Problem Solving (Continued...)
- Lecture 54 - Equations of state
- Lecture 55 - Bose-Einstein Statistics
- Lecture 56 - Problem Solving
- Lecture 57 - FERMI-DIRAC Statistics
- Lecture 58 - Radial Distribution Function
- Lecture 59 - Recap - 1
- Lecture 60 - Recap - 2