

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

NPTEL Video Course - Chemistry and Biochemistry - NOC:Quantum Chemistry of Atoms and Molecules

Subject Co-ordinator - Prof. Anindya Datta

Co-ordinating Institute - IIT - Bombay

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

Lecture 1 - Basic Introduction
Lecture 2 - Bohr Model and Beyond
Lecture 3 - The wave nature of matter
Lecture 4 - Ground Rules
Lecture 5 - Ground Rules
Lecture 6 - Particle in a box - Part I
Lecture 7 - Particle in a box - Part II
Lecture 8 - Particle in a box - Part III
Lecture 9 - Particle in a box - Uncertainty Principle
Lecture 10 - Particle in a box - Uncertainty Principle (Continued...)
Lecture 11 - Quantum Mechanical Tunneling
Lecture 12 - Harmonic Oscillator - Part 1
Lecture 13 - Harmonic Oscillator - Part 2
Lecture 14 - Harmonic Oscillator - Part 3
Lecture 15 - Harmonic Oscillators - Wave Functions and Recursion formulae
Lecture 16 - Harmonic Oscillators - Wave Functions and Recursion formulae (Continued...)
Lecture 17 - Harmonic Oscillators
Lecture 18 - Rigid Rotor - Part 1
Lecture 19 - Rigid Rotor - Part 2
Lecture 20 - Rigid Rotor - Part 3
Lecture 21 - Polar Plots of Spherical Harmonics
Lecture 22 - Angular Momentum
Lecture 23 - Angular Momentum (Continued...)
Lecture 24 - Hydrogen Atom
Lecture 25 - Hydrogen Atom
Lecture 26 - Hydrogen atom
Lecture 27 - Radial Probability distribution functions
Lecture 28 - Hydrogen atom wavefunctions
Lecture 29 - 2s orbital

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- Lecture 30 - 2p orbitals
- Lecture 31 - 3pz and 3d orbitals
- Lecture 32 - Atomic orbitals and orbital approximation
- Lecture 33 - Multi electron atoms
- Lecture 34 - He atom wavefunction
- Lecture 35 - Excited states of many electron atoms
- Lecture 36 - Introduction to Perturbation theory
- Lecture 37 - Scope of Perturbation theory
- Lecture 38 - Application of Perturbation theory
- Lecture 39 - Higher order perturbations
- Lecture 40 - Perturbation theory for non-degenerate states
- Lecture 41 - Perturbation Theory for degenerate states
- Lecture 42 - Application of Perturbation Theory for degenerate States
- Lecture 43 - Variation Method
- Lecture 44 - Variational Method (Continued...)
- Lecture 45 - Variational calculations for Harmonic Oscillator and Particle in a Box
- Lecture 46 - Secular equations in Variational calculations
- Lecture 47 - Secular equations for particle in a box
- Lecture 48 - Variational calculation for particle in a box (Continued...)
- Lecture 49 - Perturbation theory for many electron atoms
- Lecture 50 - Variational method for many electron atoms
- Lecture 51 - Hartree-Fock Equations and Self Consistent Fields
- Lecture 52 - Hartree-Fock Equations for He - Part 1
- Lecture 53 - Hartree-Fock Equations for He - Part 2
- Lecture 54 - Electronic Wavefunctions of He atom
- Lecture 55 - Valence Bond Theory and homonuclear diatomics - Part 1
- Lecture 56 - Valence Bond Theory and homonuclear diatomics - Part 2
- Lecture 57 - Molecular shape and hybrid orbitals
- Lecture 58 - sp² hybridization
- Lecture 59 - sp³ hybridization
- Lecture 60 - Non-equivalent hybrid orbitals
- Lecture 61 - Molecular Orbital Theory for H₂⁺
- Lecture 62 - Molecular orbital theory for homonuclear diatomic molecules
- Lecture 63 - Beyond Homonuclear diatomic molecules
- Lecture 64 - MOT for polyatomic molecules
- Lecture 65 - Huckel MOT-1
- Lecture 66 - Huckel MOT-2
- Lecture 67 - The last word