

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

NPTEL Video Course - Chemistry and Biochemistry - NOC: Interpretative Molecular Spectroscopy

Subject Co-ordinator - Prof. M. S. Balakrishna

Co-ordinating Institute - IIT - Bombay

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

- Lecture 1 - Various Analytical Techniques and their applications
- Lecture 2 - Introduction to  $^1\text{H}$  NMR Spectroscopy
- Lecture 3 - NMR signals and magnetic shielding
- Lecture 4 - Introduction to the concept of Chemical Shifts in NMR spectra
- Lecture 5 - Chemical Shifts for different type of protons
- Lecture 6 - N+1 Rule and Pascal's Triangle
- Lecture 7 - Coupling constants for different types of molecules
- Lecture 8 - Second Order Coupling
- Lecture 9 - Introduction to  $^{13}\text{C}$  NMR Spectroscopy
- Lecture 10 - Introduction to  $^{31}\text{P}$  NMR Spectroscopy
- Lecture 11 - Chemical Shift Range in  $^{31}\text{P}$  NMR Spectroscopy
- Lecture 12 - Examples explaining Multinuclear NMR Spectroscopy - 1
- Lecture 13 - Examples explaining Multinuclear NMR Spectroscopy - 2
- Lecture 14 - Examples explaining Multinuclear NMR Spectroscopy - 3
- Lecture 15 - Examples explaining Multinuclear NMR Spectroscopy - 4
- Lecture 16 - Examples explaining Multinuclear NMR Spectroscopy - 5
- Lecture 17 - Monitoring reaction through  $^{31}\text{P}$  NMR Spectroscopy
- Lecture 18 -  $^{19}\text{F}$ ,  $^{14}\text{N}$  and  $^{15}\text{N}$  NMR Spectroscopy
- Lecture 19 -  $^6\text{Li}$  and  $^7\text{Li}$  NMR Spectroscopy
- Lecture 20 -  $^{11}\text{B}$ ,  $^{10}\text{B}$  and  $^{199}\text{Hg}$  NMR Spectroscopy
- Lecture 21 - Introduction to UV Spectroscopy
- Lecture 22 - Types of Electronic Transitions and Woodward-Fieser Rules
- Lecture 23 - Spin Orbit Coupling and Term Symbols
- Lecture 24 - Ground State Term Symbol
- Lecture 25 - Calculating microstates for different electronic configuration
- Lecture 26 - Selection Rule of Electronic Transition
- Lecture 27 - Orgel Level Diagrams
- Lecture 28 - Racah Parameters and Tanabe-Sugano Diagrams
- Lecture 29 - Introduction to IR Spectroscopy - 1

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- Lecture 30 - Introduction to IR Spectroscopy - 2
- Lecture 31 - Interpretation of IR Spectra
- Lecture 32 - IR stretching frequencies for various functional groups
- Lecture 33 - Hook's Law - Numericals
- Lecture 34 - IR Spectra of carbonyl compounds - 1
- Lecture 35 - IR Spectra of carbonyl compounds - 2
- Lecture 36 - Numerical Problems related to IR Spectroscopy - 1
- Lecture 37 - Numerical Problems related to IR Spectroscopy - 2
- Lecture 38 - Introduction to Mass Spectrometry
- Lecture 39 - Isotope Peaks in Mass Spectrometry
- Lecture 40 - Hydrogen deficiency Index
- Lecture 41 - EI Mass Spectra of various molecules - 1
- Lecture 42 - EI Mass Spectra of various molecules - 2
- Lecture 43 - EI Mass Spectra of various molecules - 3
- Lecture 44 - Types of Mass Spectrometry
- Lecture 45 - Introduction to EPR Spectroscopy - 1
- Lecture 46 - Introduction to EPR Spectroscopy - 2
- Lecture 47 - Hyperfine Interactions
- Lecture 48 - Examples of Hyperfine Interactions
- Lecture 49 - Introduction to Mössbauer Spectroscopy (Mössbauer)
- Lecture 50 - More discussion, problems and solutions (Mössbauer)
- Lecture 51 - Problems and Solutions - 1
- Lecture 52 - Problems and Solutions - 2
- Lecture 53 - Problems and Solutions - 3
- Lecture 54 - Problems and Solutions - 4
- Lecture 55 - Problems and Solutions - 5
- Lecture 56 - Rule of Thirteen and Nitrogen Rule
- Lecture 57 - Problems and Solutions - 6
- Lecture 58 - Problems and Solutions - 7
- Lecture 59 - Problems and Solutions - 8
- Lecture 60 - Summary and conclusion