

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

NPTEL Video Course - Physics - NOC:Advanced NMR Techniques in Solution and Solid-State

Subject Co-ordinator - Prof. N. Suryaprakash

Co-ordinating Institute - IISc - Bangalore

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

- Lecture 1 - Introduction to NMR
- Lecture 2 - NMR concepts and spin physics - I
- Lecture 3 - NMR concepts and spin physics - II
- Lecture 4 - Internal interaction parameters and chemical shifts
- Lecture 5 - Chemical shifts
- Lecture 6 - Scalar couplings
- Lecture 7 - Multiplicity patterns of coupled spins and analysis of  $^1\text{H}$  NMR spectrum
- Lecture 8 - Multiplicity pattern and analysis of NMR spectra - II
- Lecture 9 - Analysis of NMR spectra and their analysis
- Lecture 10 - Heteronuclear NMR
- Lecture 11 - Introduction to Fourier series
- Lecture 12 - Complex form of Fourier series
- Lecture 13 - Fourier theorems
- Lecture 14 - Fourier transformation in NMR
- Lecture 15 - Pople notation, construction of spin Hamiltonian
- Lecture 16 - Quantum mechanical analysis of AX spectra
- Lecture 17 - Quantum mechanical analysis of AB spin system
- Lecture 18 - Quantum mechanical analysis of coupled spin systems
- Lecture 19 - RF pulses and their phases
- Lecture 20 - Receiver phase and phase cycling
- Lecture 21 - Evolution of chemical shift
- Lecture 22 - Evolution of J couplings: polarization transfer
- Lecture 23 - selective saturation in homo and heteronuclear spin systems, coupled and decoupled INEPT
- Lecture 24 - INEPT and DEPT
- Lecture 25 - Coherence transfer pathway
- Lecture 26 - Examples of coherence pathway selection
- Lecture 27 - Pulse field gradients - I
- Lecture 28 - Pulse field gradients - II
- Lecture 29 - Selective excitation, selective inversion

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- Lecture 30 - Relaxation phenomenon
- Lecture 31 - T1 relaxation concepts and measurements
- Lecture 32 - Spectral density function and relaxation mechanisms
- Lecture 33 - T1 Relaxation mechanisms
- Lecture 34 - T1 Relaxation mechanisms and T2 relaxation
- Lecture 35 - Measurement of T1 and T2
- Lecture 36 - Decoupling and NOE concepts
- Lecture 37 - DQ and ZQ relaxation pathways
- Lecture 38 - Positive and Negative NOE and spectral density functions
- Lecture 39 - NOE and correlation time
- Lecture 40 - Product operators
- Lecture 41 - Product operator analysis
- Lecture 42 - Product operator analysis of pulse sequences
- Lecture 43 - Product operators for two J coupled spins
- Lecture 44 - Spin echo sequences
- Lecture 45 - Introduction to 2D NMR
- Lecture 46 - 2D NMR concepts, 2D experiments
- Lecture 47 - 2D COSY experiment
- Lecture 48 - 2D COSY and its variants
- Lecture 49 - TOCSY Heteronuclear 2D experiments
- Lecture 50 - coupled and decoupled HSQC, HMBC, INADEQUATE, 2D Jresolved
- Lecture 51 - Introduction to multiple quantum NMR
- Lecture 52 - DQ and ZQ of coupled spins
- Lecture 53 - MQ and relative signs of couplings
- Lecture 54 - MQ and spin system filtering
- Lecture 55 - Introduction to solid state NMR
- Lecture 56 - CSA and dipolar couplings
- Lecture 57 - Magic Angle Spinning
- Lecture 58 - WAHUHA and Cross Polarization
- Lecture 59 - Cross Polarization
- Lecture 60 - CP at high speeds, Side band suppression, TOSS