NPTEL Video Course - Chemistry and Biochemistry - NOC:Chemical Crystallography

Subject Co-ordinator - Prof.Angshuman Roy Choudhury

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introduction to X-Ray Crystallography
Lecture 2 - Sources of X-Rays, Crystal Systems and Bravais lattices
Lecture 3 - Crystallographic Symmetries
Lecture 4 - Equivalent Points and 1D Lattices
Lecture 5 - 5 Fold Symmetry and 2D Lattices
Lecture 6 - 2D Space Lattices
Lecture 7 - Crystallographic Point Groups
Lecture 8 - Stereographic Projections of Point Groups
Lecture 9 - Understanding of Crystallographic Space Groups
Lecture 10 - 2D Projection of Space Groups
Lecture 11 - Tutorial - 01
Lecture 12 - 3D Space Groups and Equivalent Points
Lecture 13 - Obtaining Equivalent Points by Shifting of Origin
Lecture 14 - Representation of Orthorhombic and Tetragonal Space Groups
Lecture 15 - Miller Indices for Crystallographic Directions and Planes
Lecture 16 - Miller Indices and Planar Densities
Lecture 17 - Tutorial - 02
Lecture 18 - Cubic Structues and atomic packing factors
Lecture 19 - Ceramic Structures
Lecture 20 - Theory of X-Ray Diffraction
Lecture 21 - Tutorial - 03
Lecture 22 - Origin of Reciprocal Lattice
Lecture 23 - Bragg's Law in Reciprocal Lattice and Origin of Systematic Absences
Lecture 24 - Systematic Absences and Crystallisation Methods
Lecture 25 - Special Method of Crystallisation
Lecture 26 - Tutorial
Lecture 27 - Single Crystal X-Ray Diffraction Data Collection
Lecture 28 - Diffractometers
Lecture 29 - Diffractometers and Detectors

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Lecture 30 - Laue's and Bragg's Analysis
Lecture 31 - Experimental Methods and Theoretical Understanding of X-Ray Diffraction
Lecture 32 - Derivation of Friedel's Law from Structure Factor by Vector Space Diagram
Lecture 33 - Structure Fcator and Electron Density
Lecture 34 - Systematic Absence Conditions from Special Structure Factor Expression
Lecture 35 - Structure Refinement
Lecture 36 - Single Crystal X-Ray Diffractometer
Lecture 37 - Understanding the X-Ray Data
Lecture 38 - Data Handling (Solution and Refinement) using Various Crystallographic Packages
Lecture 39 - Structure Solution using Apex II (Bruker Diffractometer)
Lecture 40 - Direct Methods - Part 1
Lecture 41 - Direct Methods - Part 2
Lecture 42 - Disorder Treatment using Olex 2
Lecture 43 - Cambridge Structure Database and its Application
Lecture 44 - Data Reduction - Absorption Correction
Lecture 45 - Data Reduction - Lorentz and Polarization Correction
Lecture 46 - Data Reduction - Scale and Temperature Factor
Lecture 47 - Identification from Intensity Statistics the Correct Crystal System and Presence of Inversion Ce
Lecture 48 - Identification from Intensity Statistics the presence of 2 fold axis in Lattice
Lecture 49 - Phase Problem
Lecture 50 - Direct Methods - Part 1
Lecture 51 - Direct Methods - Part 2
Lecture 52 - Sigma 1 and Triplet Relationship
Lecture 53 - Patterson Method
Lecture 54 - Powder X-Ray Diffractometer - Theory
Lecture 55 - Powder X-Ray Diffractometer - Lab
Lecture 56 - Polymorphs
Lecture 57 - Polymorphs
Lecture 58 - Review of Reciprocal Lattice
Lecture 59 - Review of Reciprocal Lattice
Lecture 60 - Review of Reciprocal Lattice and Bragg's Law in Reciprocal Lattice
Lecture 61 - Ewald's Sphere and Limiting Sphere
Lecture 62 - Origin of/Introduction to Systematic absences
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