

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

NPTEL Video Course - Chemistry and Biochemistry - NOC:Fundamentals and Applications of Supramolecular Chemistry

Subject Co-ordinator - Prof. Deepak Chopra

Co-ordinating Institute - IISER Bhopal

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

Lecture 1 - Chemical Forces, Ion-Ion, Ion-Dipole and Dipole-Dipole Interactions

Lecture 2 - Induced Dipole and Dispersive Interactions

Lecture 3 - van der Waals Radius

Lecture 4 - Modelling of Dispersive Interactions, Introduction to H-bonds

Lecture 5 - Problem solving and examples in Chemical Forces

Lecture 6 - Aromatic Interactions

Lecture 7 - Understanding of sigma and pi-hole directed interactions

Lecture 8 - Halogen--pi, anion...pi and cation...pi interactions

Lecture 9 - Cation-pi, Role of close packing v/s H-bonding

Lecture 10 - Competition involving interactions in close packing of solids

Lecture 11 - Concept of Host and Guest in Supramolecular Chemistry

Lecture 12 - Lock and Key Principle and Chelate Effect

Lecture 13 - Factors affecting Chelate Effect, Thermodynamics of binding

Lecture 14 - Thermodynamics of Host-Guest Complexation, Role of Solvent

Lecture 15 - Host-Guest Complexation, Thermodynamic and Kinetic Selectivity

Lecture 16 - Cation complexation in podands, corands and lariat ethers

Lecture 17 - Cation complexation in cryptands, spherands, Molecular Conformation

Lecture 18 - Phase Transfer Catalyst, Kinetic and Thermodynamic Template Effect

Lecture 19 - Host Guest Complexation in Calixarenes

Lecture 20 - Host Guest Complexation in Cyclodextrins

Lecture 21 - Host Guest Complexation in Clathrates, Properties of Gas Hydrates

Lecture 22 - Structures of Gas Hydrates

Lecture 23 - Supramolecular Host Strategy: Trimesic Acid and Dianin's Compound

Lecture 24 - Crystal Engineering, Chemical Reaction in Solids

Lecture 25 - Solid State Reactivity and Topology of H-bonded solids

Lecture 26 - Polymorphism in Molecular Crystals

Lecture 27 - Characterization of Polymorphs

Lecture 28 - Properties and Thermodynamics of Polymorphism

Lecture 29 - Case Studies on Polymorphism, Cocrystallization, Applications to Pharmaceutical Cocrystals

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- Lecture 30 - Properties of Pharmaceutical Cocrystals
- Lecture 31 - Understand Nucleation and Growth processes in Crystallization
- Lecture 32 - Nucleation Model, Kinetic and Thermodynamic Crystal, Phase Transitions
- Lecture 33 - Types of Phase Transition
- Lecture 34 - Stimuli Driven Processes in Molecular Crystals
- Lecture 35 - Stimuli Driven Processes in Artificial Molecular Machines
- Lecture 36 - Supramolecular chemistry of complexation of Organic Cations
- Lecture 37 - Supramolecular chemistry of complexation of Anions
- Lecture 38 - Examples of anion binding
- Lecture 39 - Anion binding in Proteins and Transport processes in biology
- Lecture 40 - Ion transport processes
- Lecture 41 - Self Assembly Processes
- Lecture 42 - Self Assembly in Metal-Ligand systems forming Racks, Grids and Ladders
- Lecture 43 - Self Assembly in Helicates, Formation and Structure of DNA
- Lecture 44 - Design of Enzyme Mimics
- Lecture 45 - Role of Secondary Coordination Sphere in Chemical Transformations
- Lecture 46 - Supramolecular chemistry of surfactants
- Lecture 47 - Properties, Structures and Phase Diagram of Surfactants
- Lecture 48 - Supramolecular Amphiphiles-Structure and Applications
- Lecture 49 - Liquid Crystals-Types, Structure and Phase transitions in Liquid Crystals
- Lecture 50 - Supramolecular Gelators
- Lecture 51 - Supramolecular Catalysis via Self Assembled Molecular Cages
- Lecture 52 - Applications of Supramolecular Coordination Cages to Organic Transformations
- Lecture 53 - Applications of Molecular Barrels, Self Sorting Process
- Lecture 54 - Principles and Applications of Supramolecular Photochemistry
- Lecture 55 - Supramolecular Photochemistry and Organocatalysis
- Lecture 56 - Applications in Photophysical processes
- Lecture 57 - Molecular Wire and Cable, Molecular Switches and Non linear optical (NLO) materials
- Lecture 58 - Supramolecular Chirality
- Lecture 59 - Systems Chemistry
- Lecture 60 - Applications of Systems Chemistry