

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

NPTEL Video Course - Metallurgy and Material Science - NOC:Fundamentals and Applications of Dielectric Ceramics

Subject Co-ordinator - Dr. Ashish Garg

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Outline of the Course
- Lecture 2 - Basics of Crystal Structure
- Lecture 3 - Basics of Crystallography and Bonding
- Lecture 4 - Arrangement of Atoms in Crystal Lattice
- Lecture 5 - Structure Formation
- Lecture 6 - Pauling's Rule and Crystal Structure of Ceramics
- Lecture 7 - Ceramic Materials
- Lecture 8 - Defect Chemistry
- Lecture 9 - Defect Chemistry
- Lecture 10 - Concentration and Effect of Intrinsic Impurities
- Lecture 11 - Intrinsic and Extrinsic Defects
- Lecture 12 - Defect Concentration
- Lecture 13 - Intrinsic Ionization in Metal Oxides
- Lecture 14 - Brouwer's Diagram
- Lecture 15 - Introduction to Dielectrics
- Lecture 16 - Dielectric Displacement and Polarization Mechanism
- Lecture 17 - Polarization Mechanisms
- Lecture 18 - Dielectric Polarizability - 1
- Lecture 19 - Dielectric Polarizability - 2
- Lecture 20 - Frequency Dependence of Dielectrics
- Lecture 21 - Losses in Dielectric Materials
- Lecture 22 - Frequency Dependence of Dielectric Constant
- Lecture 23 - Dipolar Relaxation
- Lecture 24 - Debye Equations for Dipolar Relaxation
- Lecture 25 - Impedance Spectroscopy
- Lecture 26 - Impedance Spectroscopy and Dielectric Breakdown
- Lecture 27 - Basics of Non-linear Dielectrics
- Lecture 28 - Piezoelectric Effect
- Lecture 29 - Pyroelectric Effect and Electrostriction

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- Lecture 30 - Thermodynamics of Piezoelectric and Pyroelectric Materials
- Lecture 31 - Basics of Ferroelectric Materials
- Lecture 32 - Ferroelectric Phase Transitions
- Lecture 33 - Thermodynamics of Phase Transition in Ferroelectrics
- Lecture 34 - Second Order Phase Transition in Ferroelectric Materials
- Lecture 35 - First Order Phase Transition in Ferroelectric Materials
- Lecture 36 - Domain Walls in Ferroelectric Materials
- Lecture 37 - Domain Structure and Properties of Ferroelectric Materials
- Lecture 38 - Phase Diagram and Measurements of Ferroelectric Materials
- Lecture 39 - Principal of Measurements and Applications of Piezoelectric and Pyroelectric Materials
- Lecture 40 - Applications of Piezoelectric and Pyroelectric Materials