NPTEL Video Course - Metallurgy and Material Science - NOC:Non-Metallic Materials

Subject Co-ordinator - Prof. Subhasish Basu Majumder

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 30 - Introduction to electrochemistry, Galvanic cells, Cell potentials and Gibbs Energy, Concentratio
Lecture 31 - Electrochemical storage, rechargeable batteries
Lecture 32 - Introduction to electrochemical methods; cyclic voltammetry and other related techniques
Lecture 33 - Fuel Cell and Energy harvesting
Lecture 34 - Preparation of ceramic powders: auto-combustion, sol-gel synthesis, microwave assisted hydrother
Lecture 35 - Introduction to sintering, sintering mechanism
Lecture 36 - Solid-state sintering and microstructure development
Lecture 37 - Solid-state sintering and microstructure development (Continued...)
Lecture 38 - Liquid phase sintering and microstructure development, speciality sintering, reactive sintering
Lecture 39 - Processing of glass and amorphous/non-crystalline solids
Lecture 40 - Fundamental of thin film growth, growth mechanism and kinetics
Lecture 41 - Thin film growth techniques, thermal evaporation, CVD, sputtering, CSD
Lecture 42 - Fundamentals and processing of conducting and semiconducting ceramic devices
Lecture 43 - Processing of ceramics devices
Lecture 44 - Organic electronic materials: conducting polymers, semi-conducting organic materials, applicatio
Lecture 45 - Thermal analyses
Lecture 46 - Introduction of spectroscopic technique : UV-VIS spectroscopy
Lecture 47 - Infra-red and Raman spectroscopy
Lecture 48 - Optical and scanning electron microscopy
Lecture 49 - X-ray photoelectron spectroscopy
Lecture 50 - Measurement of mechanical properties, fracture toughness, MOR, hardness
Lecture 51 - Ferroelectric thin film: synthesis and characterization
Lecture 52 - Thermal analysis techniques: Differential scanning calorimetry and thermogravimetry
Lecture 53 - Measurement of optical properties
Lecture 54 - Novel ferroic composites: Synthesis and measurement
Lecture 55 - Fundamentals of corrosion, corrosion of materials
Lecture 56 - Oxidation, corrosion of ceramic materials, degradation of polymers: swelling and dissolution, bo
Lecture 57 - Ceramics in biology and medicine
Lecture 58 - Design of Ceramics
Lecture 59 - Finishing of Ceramics
Lecture 60 - Fly-ash based glazed wall tiles: A case study