

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

NPTEL Video Course - Metallurgy and Material Science - NOC:Defects in Crystalline Solids - Part I

Subject Co-ordinator - Prof. Shashank Shekhar

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Introduction to Defects
- Lecture 2 - Equilibrium Points Defects
- Lecture 3 - Energy of Vacancy Formation
- Lecture 4 - Vacancy Concentration Measurement Techniques
- Lecture 5 - Self-interstitial Defects+Frenkel Defects
- Lecture 6 - Schottky Defects+Extrinsic Defects
- Lecture 7 - Interstitials in Iron
- Lecture 8 - Defects Reaction+Kroger-Vink Notation
- Lecture 9 - Defects Reaction and its Thermodynamics
- Lecture 10 - Equilibrium Concentration using Defects Reaction
- Lecture 11 - Examples on defect reaction
- Lecture 12 - Diffusion (Interstitial Diffusion)
- Lecture 13 - Non-steady state diffusion
- Lecture 14 - Self-diffusion + Examples
- Lecture 15 - Diffusion in substitutional alloys+Diffusion along defects
- Lecture 16 - History of Dislocations
- Lecture 17 - Volterra Model + Structure of Dislocations + Burger vectors
- Lecture 18 - Characteristics of Dislocations
- Lecture 19 - Mixed Dislocations + Dislocation Loops
- Lecture 20 - Elastic Continuum Model + Strain field for screw dislocations
- Lecture 21 - Stress and Strain Fields
- Lecture 22 - Stress State around Edge Dislocations+Elastic Energy of Dislocations
- Lecture 23 - Glide Forces on Dislocations+Line Tension on Dislocations
- Lecture 24 - Climb Forces on Dislocations+Interaction Between Dislocations
- Lecture 25 - Image Forces on Dislocations
- Lecture 26 - Resistance to Dislocation Motion+Peierl Nebarro Valley
- Lecture 27 - Slip System+Examples
- Lecture 28 - Dislocations and Slips+Examples
- Lecture 29 - Critical resolved Shear Stress+Examples (Continued...)

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- Lecture 30 - Glide+Kinks
- Lecture 31 - Cross-slip+Climb
- Lecture 32 - Climb+Jogs
- Lecture 33 - Examples on Jogs+Dislocation Intersection
- Lecture 34 - Dislocation Intersection and step characteristics+Superjogs
- Lecture 35 - Strain and strain-rate due to dislocation motion+Velocity of dislocations+Observation of dislocation
- Lecture 36 - Observation of dislocation (Continued...) + Dislocation Dynamics
- Lecture 37 - Dislocations in FCC+Partial dislocations
- Lecture 38 - Partial dislocations (Continued...) +Stacking Fault
- Lecture 39 - Thompson's Tetrahedron+Examples
- Lecture 40 - Dislocations in BCC+Asymmetry of Slip