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Oscillator Strengths; 4-C Features of the Absorption Spectrum; 4-D 1 and the Dielectric Constant; CHAPTER 5 - Other Dielectric Properties; 5-A Bond Dipoles and Higher-Order Susceptibilities; 5-B Effective Atomic Charge; 5-C Dielectric Screening; 5-D Ternary Compounds 5-E Magnetic Susceptibility CHAPTER 6 - The Energy Bands; 6-A Accurate Band Structures; 6-B LCAO Interpretation of the Bands; 6-C The Conduction Bands; 6-D Effective Masses; 6-E Impurity States and Excitons; CHAPTER 7 - The Total Energy; 7-A The Overlap Interaction; 7-B Bond Length, Cohesive Energy, and the Bulk Modulus; 7-C Cohesion in Polar Covalent Solids; CHAPTER 8 - Elasticity; 8-A Total Energy Calculations; 8-B Rigid Hybrids; 8-C Rehybridization; 8-D The Valence Force Field; 8-E Internal Displacements, and Prediction of c_{44} ; CHAPTER 9 - Lattice Vibrations; 9-A The Vibration Spectrum 11-C The Bonding Unit 11-D Bands and Electronic Spectra; 11-E Mechanical Properties; 11-F Vibrational Spectra; 11-G Coupling of Vibrations to the Infrared; PART III - CLOSED-SHELL SYSTEMS; CHAPTER 12 - Inert-Gas Solids; 12-A Interatomic Interactions; 12-B Electronic Properties; CHAPTER 13 - Ionic Compounds; 13-A The Crystal Structure; 13-B Electrostatic Energy and the Madelung Potential; 13-C Ion - ion Interactions; 13-D Cohesion and Mechanical Properties; 13-E Structure Determination and Ionic Radii; CHAPTER 14 - Dielectric Properties of Ionic Crystals; 14-A Electronic Structure and Spectra 14-B Dielectric Susceptibility

Sommario/riassunto

""Should be widely read by practicing physicists, chemists and materials scientists."" - Philosophical Magazine In this comprehensive and innovative text, Professor Harrison (Stanford University) offers a basic understanding of the electronic structure of covalent and ionic solids, simple metals, transition metals, and their compounds. The book illuminates the relationships of the electronic structures of these materials and shows how to calculate dielectric, conducting, and bonding properties for each. Also described are various methods of approximating electronic structure, providing insight
