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Nota di contenuto	CHEMISTRY AND PHYSICS OF MECHANICAL HARDNESS; TABLE OF CONTENTS; Preface; 1 Introduction; 1.1 Why Hardness Matters (A Short History); 1.2 Purpose of This Book; 1.3 The Nature of Hardness; References; 2 Indentation; 2.1 Introduction; 2.2 The Chin-Gilman Parameter; 2.3 What Does Indentation Hardness Measure?; 2.4 Indentation Size Effect; 2.5 Indentation Size (From Macro to Nano); 2.6 Indentation vs. Scratch Hardness; 2.7 Blunt or Soft Indenters; 2.8 Anisotropy; 2.9 Indenter and Specimen Surfaces; References; 3 Chemical Bonding; 3.1 Forms of Bonding; 3.2 Atoms; 3.3 State Symmetries 3.4 Molecular Bonding (Hydrogen) 3.5 Covalent Bonds; 3.6 Bonding in Solids; 3.6.1 Ionic Bonding; 3.6.2 Metallic Bonding; 3.6.3 Covalent Crystals; 3.7 Electrodynamic Bonding; 3.8 Polarizability; References; 4 Plastic Deformation; 4.1 Introduction; 4.2 Dislocation Movement; 4.3 Importance of Symmetry; 4.4 Local Inelastic Shearing of Atoms; 4.5

Dislocation Multiplication; 4.6 Individual Dislocation Velocities (Microscopic Distances); 4.7 Viscous Drag; 4.7.1 Pure Metals; 4.7.2 Covalent Crystals; 4.8 Deformation-Softening and Elastic Relaxation; 4.9 Macroscopic Plastic Deformation; References
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6.2.7 Ferroelectric Domain-Walls 6.2.8 Twin Boundaries; References; 7 Transition Metals; 7.1 Introduction; 7.2 Rare Earth Metals; References; 8 Intermetallic Compounds; 8.1 Introduction; 8.2 Crystal Structures; 8.2.1 Sigma Phase; 8.2.2 Laves Phases; 8.2.3 Ni(3)Al; 8.3 Calculated Hardness of NiAl; 8.4 Superconducting Intermetallic Compounds; 8.5 Transition Metal Compounds; References; 9 Ionic Crystals; 9.1 Alkali Halides; 9.2 Glide in the NaCl Structure; 9.3 Alkali Halide Alloys; 9.4 Glide in CsCl Structure; 9.5 Effect of Imputities; 9.6 Alkaline Earth Fluorides; 9.7 Alkaline Earth Sulfides
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11.4 Hexagonal (Rhombohedral) Oxides

Sommario/riassunto

A comprehensive treatment of the chemistry and physics of mechanical hardness Chemistry and Physics of Mechanical Hardness presents a general introduction to hardness measurement and the connections between hardness and fundamental materials properties. Beginning with an introduction on the importance of hardness in the development of technology, the book systematically covers: Indentation Chemical bonding Plastic deformation Covalent semiconductors Simple metals and alloys Transition metals Intermetallic compounds Ionic crystals