1. Record Nr. UNINA9911004859103321 Autore Smallman R. E. Titolo Modern physical metallurgy and materials engineering: science, process, applications / / R.E. Smallman, R.J. Bishop Boston, : Butterworth-Heinemann, 1999 Pubbl/distr/stampa **ISBN** 1-281-07730-5 9786611077303 0-08-051199-6 Edizione [Sixth edition] 1 online resource (449 pages) Descrizione fisica Disciplina 669/.9Physical metallurgy Soggetti Materials science Ciència dels materials Metal·lúrgia física Lingua di pubblicazione Inglese **Formato** Materiale a stampa Livello bibliografico Monografia Note generali Description based upon print version of record. Nota di bibliografia Includes bibliographical references and index. Front Cover: Modern Physical Metallurgy and Materials Engineering: Nota di contenuto Science, process, applications; Copyright Page; Contents; Preface; Chapter 1. The structure and bonding of atoms; 1.1 The realm of materials science: 1.2 The free atom: 1.3 The Periodic Table: 1.4 Interatomic bonding in materials; 1.5 Bonding and energy levels; Chapter 2. Atomic arrangements in materials; 2.1 The concept of ordering; 2.2 Crystal lattices and structures; 2.3 Crystal directions and planes; 2.4 Stereographic projection; 2.5 Selected crystal structures; 2.6 Inorganic glasses; 2.7 Polymeric structures Chapter 3. Structural phases their formation and transitions; 3.1 Crystallization from the melt; 3.2 Principles and applications of phase diagrams; 3.3 Principles of alloy theory; 3.4 The mechanism of phase changes; Chapter 4. Defects in solids; 4.1 Types of imperfection; 4.2 Point defects; 4.3 Line defects; 4.4 Planar defects; 4.5 Volume defects; 4.6 Defect behaviour in some real materials; 4.7 Stability of defects; Chapter 5. The characterization of materials; 5.1 Tools of

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## Sommario/riassunto

For many years, various editions of Smallman's Modern Physical Metallurgy have served throughout the world as a standard undergraduate textbook on metals and alloys. In 1995, it was rewritten and enlarged to encompass the related subject of materials science and engineering and appeared under the title Metals & Materials: Science, Processes, Applications offering a comprehensive amount of a much wider range of engineering materials. Coverage ranged from pure elements to superalloys, from glasses to engineering ceramics, and from everyday plastics to in situ composites, Amongst other favourable