1. Record Nr. UNINA9910957881203321 Autore Petty Michael C **Titolo** Molecular electronics: from principles to practice / / Michael C. Petty Pubbl/distr/stampa Chichester, England;; Hoboken, NJ,: John Wiley & Sons, c2007 **ISBN** 1-282-12308-4 9786612123085 0-470-72388-2 Edizione [1st ed.] Descrizione fisica 1 online resource (548 p.) Wiley series in materials for electronic and optoelectronic applications Collana Disciplina 621.381 Soggetti Molecular electronics 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. Nota di contenuto Molecular Electronics From Principles to Practice; Contents; Series Preface; Preface; Acknowledgements; Symbols and Abbreviations; 1 Scope of Molecular Electronics; 1.1 INTRODUCTION; 1.2 MOLECULAR MATERIALS FOR ELECTRONICS; 1.3 MOLECULAR-SCALE ELECTRONICS; 1.3.1 Evolution of Microelectronics: 1.3.2 Moore's Laws: 1.3.3 Beyond Moore; 1.4 THE BIOLOGICAL WORLD; 1.5 FUTURE OPPORTUNITIES; 1.6 CONCLUSIONS; BIBLIOGRAPHY; REFERENCES; 2 Materials' Foundations; 2.1 INTRODUCTION; 2.2 ELECTRONIC STRUCTURE; 2.2.1 Atomic Structure; 2.2.2 Electrons in Atoms; 2.2.3 Filling of Orbitals 2.2.4 The Periodic Table 2.3 CHEMICAL BONDING; 2.3.1 Bonding Principles; 2.3.2 Ionic Bond; 2.3.3 Covalent Bond; 2.3.4 Metallic Bonding; 2.3.5 Van der Waals Bonding; 2.3.6 Hydrogen Bonding; 2.4 BONDING IN ORGANIC COMPOUNDS; 2.4.1 Hybridized Orbitals; 2.4.2 Isomers; 2.4.3 Double and Triple Bonds; 2.5 CRYSTALLINE AND NONCRYSTALLINE MATERIALS; 2.5.1 States of Matter; 2.5.2 Phase Changes and Thermodynamic Equilibrium; 2.5.3 The Crystal Lattice; 2.5.4 Crystal Systems; 2.5.5 Miller Indices; 2.5.6 Distance Between Crystal Planes; 2.5.7 Defects; 2.5.8 Amorphous Solids; 2.6 POLYMERS 2.6.1 Molecular Weight2.6.2 Polymer Structure; 2.6.3 Polymer Crystallinity: 2.7 SOFT MATTER: EMULSIONS, FOAMS AND GELS; 2.8 DIFFUSION; BIBLIOGRAPHY; REFERENCE; 3 Electrical Conductivity; 3.1

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Sommario/riassunto

This consistent and comprehensive text is unique in providing an informed insight into molecular electronics by contrasting the prospects for molecular scale electronics with the continuing development of the inorganic semiconductor industry. Providing a wealth of information on the subject from background material to possible applications, Molecular Electronics contains all the need to know information in one easily accessible place. Speculation about future developments has also been included to give the whole picture of this increasingly popular and important topic.