

1. Record Nr.	UNINA9910142437403321
Titolo	Scanning probe microscopies beyond imaging [[electronic resource]] : manipulation of molecules and nanostructures // edited by Paolo Samori
Pubbl/distr/stampa	Weinheim, : Wiley-VCH, 2006
ISBN	1-280-72346-7 9786610723461 3-527-60856-7 3-527-60851-6
Descrizione fisica	1 online resource (570 p.)
Classificazione	33.03 51.30
Altri autori (Persone)	SamoriPaolo
Disciplina	502.82
Soggetti	Scanning probe microscopy Microscopy
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	Scanning Probe Microscopies Beyond Imaging; Foreword; Contents; Preface; List of Authors; Part I Scanning Tunneling Microscopy-Based Approaches; Nanoscale Structural, Mechanical and Electrical Properties; 1 Chirality in 2D; 1.1 Introduction; 1.2 Chirality and STM: From 0D to 2D; 1.2.1 Determination of Absolute Chirality; 1.2.2 Expression of 2D Chirality by Enantiopure Molecules; 1.2.3 Racemic Mixture of Chiral Molecules; 1.2.4 Achiral Molecules; 1.2.5 Systems with Increased Complexity; 1.2.6 Multicomponent Systems; 1.2.6.1 Mixed Systems; 1.2.6.2 Cocrystals 1.2.7 Chemisorption versus Physisorption1.2.8 The Effect of Molecular Adsorption on Substrates: Toward Chiral Substrates; 1.2.9 Chirality and AFM; 1.3 Conclusion; Acknowledgements; References; 2 Scanning Tunneling Spectroscopy of Complex Molecular Architectures at Solid/Liquid Interfaces: Toward Single-Molecule Electronic Devices; 2.1 Introduction; 2.2 STM/STS of Molecular Adsorbates; 2.3 An Early Example of STS at the Solid/Liquid Interface; 2.4 Ultrahigh Vacuum versus Solid/Liquid Interface; 2.5 Probing -Coupling at the Single-

Molecule Level by STS

2.6 Molecular Diodes and Prototypical Transistors 2.7 Conclusions; Acknowledgements; References; 3 Molecular Repositioning to Study Mechanical and Electronic Properties of Large Molecules; 3.1 Introduction; 3.2 Specially Designed Molecules; 3.3 STM-Induced Manipulation; 3.3.1 Manipulation of Single Atoms; 3.3.2 Repositioning of Molecules at Room Temperature; 3.3.3 Manipulation in Constant Height Mode; 3.4 Mechanical Properties: Controlled Manipulation of Complex Molecules; 3.5 Inducing Conformational Changes: A Route to Molecular Switching; 3.6 The Role of the Substrate 3.7 Electronic Properties: Investigation of the Molecule-Metal Contact 3.8 Perspectives; Acknowledgements; References; 4 Inelastic Electron Tunneling Microscopy and Spectroscopy of Single Molecules by STM; 4.1 Introduction; 4.1.1 Working Principle; 4.2 Experimental Results; 4.2.1 C(60) on Ag(110); 4.2.2 C(6)H(6) on Ag(110); 4.3 Theory; 4.3.1 Extension of Tersoff-Hamman Theory to IETS-STM; 4.3.2 Some Model Systems; 4.3.3 Acetylene Molecules on Cu(100); 4.3.4 Oxygen Molecules on Ag(110); 4.3.5 Ammonia Molecules on Cu(100); 4.4 Conclusion; References

Part II Scanning Force Microscopy-Based Approaches Patterning; 5 Patterning Organic Nanostructures by Scanning Probe Nanolithography; 5.1 Importance of Patterning Organic Nanostructures; 5.2 Direct Patterning of Organic Thin Films; 5.2.1 Fabrication of Nanostructures by a Local Modification; 5.2.1.1 Nanorecording for Memory Storage; 5.2.1.2 Local Probe Photolithography; 5.2.1.3 Nanorubbing; 5.2.2 Self-Organization of Molecular Nanostructures Triggered by SPM; 5.3 Assembly of Organic Structures on Nanofabricated Patterns; 5.3.1 Replacement Nanolithography on Self-Assembly Monolayers (SAMs) 5.3.2 Template Growth of Molecular Nanostructures

Sommario/riassunto

This first book to focus on the use of SPMs to actively manipulate molecules and nanostructures on surfaces goes way beyond conventional treatments of scanning microscopy merely for imaging purposes. It reviews recent progress in the use of SPMs on such soft materials as polymers, with a particular emphasis on chemical discrimination, mechanical properties, tip-induced reactions and manipulations, as well as their nanoscale electrical properties. Detailing the practical application potential of this hot topic, this book is of great interest to specialists of wide-ranging disciplines, including
