

1. Record Nr.	UNINA9910807915103321
Titolo	Molecular and supramolecular information processing : from molecular switches to unconventional computing // edited by Evgeny Katz
Pubbl/distr/stampa	Weinheim, : Wiley-VCH Chichester, : John Wiley [distributore], 2012
ISBN	3-527-64545-4 3-527-64544-6 1-283-59694-6 9786613909398 3-527-64546-2
Edizione	[1st ed.]
Descrizione fisica	1 online resource (383 p.)
Altri autori (Persone)	KatzEvgeny
Disciplina	541.3 660.60285
Soggetti	Chemistry, Physical and theoretical - Data processing Molecules - Data processing
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 and Supramolecular Information Processing; Contents; Preface; List of Contributors; 1 Molecular Information Processing: from Single Molecules to Supramolecular Systems and Interfaces - from Algorithms to Devices - Editorial Introduction; References; 2 From Sensors to Molecular Logic: A Journey; 2.1 Introduction; 2.2 Designing Luminescent Switching Systems; 2.3 Converting Sensing/Switching into Logic; 2.4 Generalizing Logic; 2.5 Expanding Logic; 2.6 Utilizing Logic; 2.7 Bringing in Physical Inputs; 2.8 Summary and Outlook; Acknowledgments; References 3 Binary Logic with Synthetic Molecular and Supramolecular Species 3.1 Introduction; 3.1.1 Information Processing: Semiconductor Devices versus Biological Structures; 3.1.2 Toward Chemical Computers?; 3.2 Combinational Logic Gates and Circuits; 3.2.1 Basic Concepts; 3.2.2 Bidirectional Half Subtractor and Reversible Logic Device; 3.2.3 A Simple Unimolecular Multiplexer-Demultiplexer; 3.2.4 An Encoder/Decoder Based on Ruthenium Tris(bipyridine); 3.2.5 All-

Optical Integrated Logic Operations Based on Communicating Molecular Switches; 3.3 Sequential Logic Circuits; 3.3.1 Basic Concepts 3.3.2 Memory Effect in Communicating Molecular Switches 3.3.3 A Molecular Keypad Lock; 3.3.4 A Set-Reset Memory Device Based on a Copper Rotaxane; 3.4 Summary and Outlook; Acknowledgments; References; 4 Photonically Switched Molecular Logic Devices; 4.1 Introduction; 4.2 Photochromic Molecules; 4.3 Photonic Control of Energy and Electron Transfer Reactions; 4.3.1 Energy Transfer; 4.3.2 Electron Transfer; 4.4 Boolean Logic Gates; 4.5 Advanced Logic Functions; 4.5.1 Half-Adders and Half-Subtractors; 4.5.2 Multiplexers and Demultiplexers; 4.5.3 Encoders and Decoders 4.5.4 Sequential Logic Devices 4.5.5 An All-Photonic Multifunctional Molecular Logic Device; 4.6 Conclusion; References; 5 Engineering Luminescent Molecules with Sensing and Logic Capabilities; 5.1 Introduction; 5.2 Engineering Luminescent Molecules; 5.3 Logic Gates with the Same Modules in Different Arrangements; 5.4 Consolidating AND Logic; 5.5 "Lab-on-a-Molecule" Systems; 5.6 Redox-Fluorescent Logic Gates; 5.7 Summary and Perspectives; References; 6 Supramolecular Assemblies for Information Processing; 6.1 Introduction; 6.2 Recognition of Metal Ion Inputs by Crown Ethers 6.3 Hydrogen-Bonded Supramolecular Assemblies as Logic Devices 6.4 Molecular Logic Gates with [2]Pseudorotaxane- and [2]Rotaxane-Based Switches; 6.5 Supramolecular Host-Guest Complexes with Cyclodextrins and Cucurbiturils; 6.6 Summary; Acknowledgments; References; 7 Hybrid Semiconducting Materials: New Perspectives for Molecular-Scale Information Processing; 7.1 Introduction; 7.2 Synthesis of Semiconducting Thin Layers and Nanoparticles; 7.2.1 Microwave Synthesis of Nanoparticles; 7.2.2 Chemical Bath Deposition; 7.2.2.1 Sulfide Ion Precursors; 7.2.2.2 Commonly Used Ligand 7.3 Electrochemical Deposition

Sommario/riassunto

Edited by a renowned and much cited chemist, this book covers the whole span of molecular computers that are based on non-biological systems. The contributions by all the major scientists in the field provide an excellent overview of the latest developments in this rapidly expanding area. A must-have for all researchers working on this very hot topic. Perfectly complements Biomolecular Information Processing, also by Prof. Katz, and available as a two-volume set.
