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Nota di contenuto	Cover -- Title Page -- Copyright -- Contents -- Preface -- Author Biographies -- List of Acronyms and Abbreviations -- Chapter 1 Introduction -- 1.1 Different Interfaces in OFETs -- 1.2 Brief Historic Overview of Interface Engineering in OFETs -- 1.3 Scope of the Book -- Chapter 2 Interfacial Modification Methods -- 2.1 Noncovalent Modification Methods -- 2.1.1 Charge Insertion Layer at the Electrode Surface -- 2.1.2 Dielectric Surface Passivation Methods -- 2.2 Covalent Modification Methods -- 2.2.1 SAM Modification of Electrodes -- 2.2.2 SAM Modification of Dielectrics -- 2.2.2.1 SAM/SiO ₂ Dielectrics -- 2.2.2.2 SAM/Highk Dielectrics -- 2.2.2.3 SelfAssembled Monolayer FieldEffect Transistors (SAMFETs) -- 2.3 Efforts in Developing New Methods -- Chapter 3 Semiconductor/Semiconductor Interface -- 3.1 Influence of Additives on a Material's Nucleation and Morphology -- 3.1.1 Solvent Additives -- 3.1.2 Nucleating Agents -- 3.1.3 Template Mediated Crystallization -- 3.1.4 Blending with Insulating Polymers -- 3.1.5 Blending with Polymer Elastomer: Nanoconfinement Effect -- 3.2 Enhancing the Performance Through Semiconductor Heterojunctions -- 3.2.1 Planar Bilayer Heterostructures -- 3.2.2 MolecularLevel Heterojunction -- 3.2.3 Supramolecular Arrangement of the

Heterojunctions -- 3.3 Integrating Molecular Functionalities into Electrical Circuits -- 3.3.1 Charge Trapping Induced Memory Effect -- 3.3.2 Photochromism Induced Switching Effect -- Chapter 4 Semiconductor/Electrode Interface -- 4.1 Work Function Tuning for Better Contact -- 4.1.1 SAM Modification -- 4.1.2 Charge Insertion Layer Modification -- 4.1.3 Polymer Based Electrodes -- 4.1.4 Carbon Nanomaterial Based Electrodes -- 4.1.5 Covalent Bond Formation at the Molecular Level -- 4.2 Installing Switching Effects at Semiconductor/Electrode Interface.
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Sommario/riassunto

Interface Engineering in Organic Field-Effect Transistors: A systematic summary of advances in developing effective methodologies of interface engineering in organic field-effect transistors, from models to experimental techniques. Interface Engineering in Organic Field-Effect Transistors covers the state of the art in organic field-effect transistors and reviews charge transport at the interfaces, device design concepts, and device fabrication processes, and gives an outlook on the development of future optoelectronic devices. This book starts with an overview of the commonly adopted methods to obtain various semiconductor/semiconductor interfaces and charge transport mechanisms at these heterogeneous interfaces. Then, it covers the modification at the semiconductor/electrode interfaces, through which to tune the work function of electrodes as well as reveal charge injection mechanisms at the interfaces. Charge transport physics at the semiconductor/dielectric interface is discussed in detail. The book

describes the remarkable effect of SAM modification on the semiconductor film morphology and thus the electrical performance. In particular, valuable analyses of charge trapping/detrapping engineering at the interface to realize new functions are summarized. Finally, the sensing mechanisms that occur at the semiconductor/environment interfaces of OFETs and the unique detection methods capable of interfacing organic electronics with biology are discussed. Specific sample topics covered in Interface Engineering in Organic Field-Effect Transistors include: Noncovalent modification methods, charge insertion layer at the electrode surface, dielectric surface passivation methods, and covalent modification methods. Charge transport mechanism in bulk semiconductors, influence of additives on materials' nucleation and morphology, solvent additives, and nucleation agents. Nanoconfinement effect, enhancing the performance through semiconductor heterojunctions, planar bilayer heterostructure, ambipolar charge-transfer complex, and supramolecular arrangement of heterojunctions. Dielectric effect in OFETs, dielectric modification to tune semiconductor morphology, surface energy control, microstructure design, solution shearing, eliminating interfacial traps, and SAM/SiO₂ dielectrics. A timely resource providing the latest developments in the field and emphasizing new insights for building reliable organic electronic devices, Interface Engineering in Organic Field-Effect Transistors is essential for researchers, scientists, and other interface-related professionals in the fields of organic electronics, nanoelectronics, surface science, solar cells, and sensors.
