

1. Record Nr.	UNINA9910555096603321
Titolo	Flexible carbon-based electronics / / edited by Paolo Samori and Vincenzo Palermo
Pubbl/distr/stampa	Weinheim, Germany : , : Wiley-VCH, , 2018
ISBN	3-527-80488-9 3-527-80489-7
Descrizione fisica	1 online resource (337 pages)
Collana	Advanced Nanocarbon Materials Ser.
Disciplina	621.381
Soggetti	Flexible electronics Electronic books.
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Cover -- Title Page -- Copyright -- Contents -- About the Series Editor -- Preface -- Chapter 1 Soft Composites with Tunable Optical and Electrical Properties -- 1.1 Introduction -- 1.2 Soft Color Composites -- 1.3 Hybrid Viscoelastic Polymer Composites -- 1.4 Elastomeric Conductive Composites -- 1.5 Conclusions and Future Perspectives -- Acknowledgments -- References -- Chapter 2 Organic Semiconductors for Transparent Electronics -- 2.1 Introduction -- 2.2 Optically Transparent Semiconductor Families -- 2.2.1 Thinfilm Transistors -- 2.2.2 Oligothiophenes -- 2.2.3 Fused Heteroacenes -- 2.2.4 Rylene and Fused Aromatic Dicarboximides -- 2.2.5 Other Semiconductors -- 2.3 Conclusions and Perspectives -- References -- Chapter 3 Flexible Carbonbased Electronics: Flexible Solar Cells -- 3.1 Introduction -- 3.2 Applications -- 3.3 Device Physics -- 3.3.1 Structure and Operating Principle -- 3.3.2 Solar Cell Characteristics -- 3.4 New Materials -- 3.5 Flexible Electrodes -- 3.6 Processing -- 3.6.1 Laboratory Scale -- 3.6.2 Industrial Scale -- 3.6.3 Solar Modules -- 3.7 Summary and Outlook -- References -- Chapter 4 Development of Organic Fieldeffect Transistors for Operation at High Frequency -- 4.1 Introduction -- 4.2 The Transition Frequency f_T -- 4.2.1 Measurement Methods -- 4.3 Highfrequency Organic Fieldeffect Transistors -- 4.3.1 Improvement of the Effective Charge Mobility -- 4.3.2 The Reduction of the Footprint -- 4.3.3 Achieving Highfrequency Operation at a Low Bias Voltage --

4.3.4 Integration into Upscalable Fabrication Processes -- 4.4
Conclusions and Perspectives -- References -- Chapter 5 Graphene for Flexible Electronics -- 5.1 Introduction -- 5.2 Synthesis and Transfer Process -- 5.2.1 Chemical Vapor Deposition (CVD): Scalable Growth -- 5.2.2 Transfer Process -- 5.3 Applications -- 5.3.1 Transparent Electrodes.
5.3.1.1 Touch Screen/Panel -- 5.3.1.2 Organic LightEmitting Diodes -- 5.3.1.3 Photovoltaic Device -- 5.3.2 Fieldeffect Transistors -- 5.3.3 Sensors -- 5.3.4 Nanogenerator for Energy Harvesting -- 5.4
Conclusions and Perspectives -- References -- Chapter 6 Printing 2D Materials -- 6.1 Introduction -- 6.2 Printing Techniques -- 6.2.1 Spin Coating -- 6.2.2 Blade Coating -- 6.2.3 Rod Coating -- 6.2.4 Spray Coating -- 6.2.5 Screen Printing -- 6.2.6 Flexographic Printing -- 6.2.7 Gravure Printing -- 6.2.8 Inkjet Printing -- 6.3 Formulation and Characterization of Electronic Inks -- 6.3.1 Ink Rheology and Surface Chemistry -- 6.3.2 Dispersion of Functional Layered Materials -- 6.4 Exfoliation of Layered Crystals -- 6.4.1 Ultrasonication -- 6.4.2 Ball Milling -- 6.4.3 Shear Exfoliation -- 6.4.4 Microfluidization -- 6.5 Stabilization of Exfoliated Flakes -- 6.5.1 Surfactants -- 6.6 Formulation: From Dispersion to Ink -- 6.6.1 The Rheology of Inks -- 6.7 Printing and Coating of 2Dcrystalbased Inks -- 6.7.1 Spin Coating -- 6.7.2 Blade and Rod Coating -- 6.7.3 Spray Coating -- 6.7.4 Screen Printing -- 6.7.5 Inkjet Printing -- 6.7.6 Characterization Techniques -- 6.8 Applications -- 6.8.1 Printed Electronics -- 6.8.2 Printed Optoelectronics -- 6.8.3 Sensors and Wearable Devices -- 6.8.4 Energy Devices -- 6.8.5 Printed THz Devices -- 6.9 Outlook and Future Perspectives -- Acknowledgments -- References -- Chapter 7
Characterization of Graphene Flexible Materials and Displays -- 7.1 Introduction to Display Systems -- 7.2 Graphene/Flexible Polymer Electrodes -- 7.2.1 Sheet Resistance and Transmittance of Graphene/Flexible Polymer Electrodes -- 7.2.2 Mechanical Robustness of Graphene/Flexible Polymer Electrodes -- 7.3 Graphenebased Flexible Displays -- 7.4 Outlook -- References -- Chapter 8 AMOLED Display Technology and Applications -- 8.1 Introduction.
8.2 Commercial Flexible AMOLED Displays -- 8.3 OLED Displays -- 8.3.1 Structure and Electrooptic Behavior -- 8.3.2 Lifetime Effects in OLEDs -- 8.4 AMOLED Display Design -- 8.4.1 TFT Technologies for Flexible AMOLED Displays -- 8.4.1.1 Polysilicon TFTs -- 8.4.1.2 Metal Oxide TFTs -- 8.4.2 AMOLED Pixel Design -- 8.4.3 Integrated Display Drivers -- 8.5 Substrates and Barrier Coatings -- 8.5.1 Substrates -- 8.5.2 Barrier Coatings -- 8.5.3 Additional Layers -- 8.5.4
Characterization of Flexibility -- 8.6 The Future of Flexible AMOLED Displays -- References -- Chapter 9 Flexible Batteries -- 9.1 Introduction -- 9.2 Electrochemical Power Sources - Theoretical Basics -- 9.2.1 Conventional (lithiumion) battery buildup -- 9.3 Basic Material Concepts for Flexible Energy Storage Systems -- 9.3.1 Flexible Electrodes -- 9.3.2 Flexible Electrolyte -- 9.3.3 Flexible Packaging -- 9.4 Basic Design Concepts for Flexible Energy Storage Systems -- 9.4.1 Thinfilm/Printed Batteries -- 9.4.2 Fibershaped/Cabletype Batteries -- 9.4.3 Embedded Batteries -- 9.5 Summary and Outlook -- References -- Chapter 10 Flexible Organic Bioelectronics and Biosensors -- 10.1 Introduction -- 10.2 Organic Material -- 10.3 Flexible Organic Electronics for Biology -- 10.3.1 OTFTs -- 10.3.1.1 OFET Sensors -- 10.3.1.2 OECTs Sensors -- 10.3.2 Organic Electrodes -- 10.3.2.1 Biological Sensing -- 10.3.2.2 Neural Recording/Stimulation -- 10.3.2.3 Others -- 10.3.3 eTextiles -- 10.4 Conclusion -- References -- Index -- EULA.

