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References

Chapter 3 Carbon Nanotube Thin-Film Transistors 3.1 Introduction; 3.2 Individual SWCNTs and SWCNT Thin Films; 3.3 Chemical Vapor Deposition Growth of SWCNT TFTs; 3.4 Solution-Based Methods for SWCNT TFTs; 3.5 Inkjet Printing of Flexible SWCNT TFTs; 3.6 Fabrication Schemes for High-Performance Inkjet-Printed SWCNT TFTs; 3.7 Inkjet Printing of SWCNT CMOS Inverters; 3.8 Inkjet Printing of Aligned SWCNT Films; 3.9 Conclusion; References; Chapter 4 Organic Single-Crystalline Semiconductors for Flexible Electronics Applications; 4.1 Introduction 4.2 Electronic and Structural Properties of Single Crystals 4.2.1 Intrinsic Transport Properties; 4.2.2 Crystal Dimensionality; 4.3 Crystallization Techniques; 4.3.1 Growth from Vapor Phase; 4.3.2 Growth from Solution; 4.4 Single-Crystal Flexible Electronic Devices; 4.4.1 Fundamental Mechanics for Flexible Electronics; 4.4.2 Mechanical Versatility of Organic Single Crystals; 4.4.3 Importance of Mechanical Properties Knowledge; 4.4.4 The Elastic Constants of Rubrene Single Crystals; 4.5 Strategies for Flexible Organic Single-Crystal Device Fabrication 4.5.1 Discrete Ultrathin Single-Crystal Transistor 4.5.2 Transistor Arrays Based on Micropatterned Single Crystals; 4.5.3 Flexible Single-Crystal Nanowire Devices; 4.6 Conclusions; Acknowledgments; References; Chapter 5 Solution-Processable Quantum Dots; 5.1 Introduction; 5.2 Optimization of the Colloidal Synthesis of Quantum Dots by Selection of Suitable Solvents, Ligands, and Precursors; 5.3 Large-Scale Synthesis of Quantum Dots; 5.4 Surface Chemistry of Quantum Dots; 5.5 Post-Synthetic Chemical Modification of Nanocrystals; 5.6 Conclusions and Outlook; References Chapter 6 Inorganic Semiconductor Nanomaterials for Flexible Electronics

Sommario/riassunto

From materials to applications, this ready reference covers the entire value chain from fundamentals via processing right up to devices, presenting different approaches to large-area electronics, thus enabling readers to compare materials, properties and performance. Divided into two parts, the first focuses on the materials used for the electronic functionality, covering organic and inorganic semiconductors, including vacuum and solution-processed metal-oxide semiconductors, nanomembranes and nanocrystals, as well as conductors and insulators. The second part reviews the devices and applicatio
