Micro & Nano Technologies Series

ADVANCED NANOMATERIALS FOR SOLAR CELLS AND LIGHT-EMITTING DIODES

Edited by Feng Gao

Advanced Nanomaterials for Solar Cells and Light-Emitting Diodes is an important reference book giving the latest data on the design of functional nanomaterials for solar cells and light-emitting diode (LED) devices, as well as recent and historical research into this subject.

Each topic covered in this book includes applications based on these materials and emphasizes how to improve the performance of solar cells and LEDs via materials design, with a focus on nanomaterials. It discusses the importance of nanomaterials as the active layers in solar cells and LEDs, along with the progress that has been made in their use in electron-transporting layers (ETLs) and hole-transporting layers (HTLs). Specifically, it reviews the nanomorphology of polymers, small molecules, and organic-inorganic perovskites in these layers. The design, fabrication, and properties of metal-oxide-based nanostructures as ETLs and HTLs are also reviewed. In addition, the development of plasmonic nanomaterials for solar cells and LEDs is discussed.

Key Features:

- Discusses the latest studies on nanostructured materials, including small molecules, polymers, organic-inorganic perovskites, and many other relevant materials systems for solar cells and LEDs
- Addresses each promising materials system comprehensively, from principles to processes, detailing the advantages and disadvantages of the most relevant methods of processing and fabrication
- Looks ahead to the most promising techniques being developed to improve the performance of solar cells and LEDs

Feng Gao is an associate professor and Wallenberg Academy Fellow at Linköping University in Sweden. He obtained his PhD from the University of Cambridge in 2011, followed by a Marie Curie postdoctorate fellowship at Linköping University. He received the ERC Starting Grant in 2016. His group currently focuses on research into solution-processed energy materials and devices, mainly based on organic semiconductors (OSCs) and metal halide perovskites.

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