



Won Kook Choi

ZnO-Nanocarbon Core-Shell Type Hybrid Quantum Dots

Series: Nanoscience and Nanotechnology

- Provides an introduction to synthetic processing, chemical and structural analysis of eco-friendly ZnO nanocarbon (C60, Single-Walled CNT, Graphene) core-shell hybrid quantum dots
- Describes the physical and chemical superiority of ZnO-nanocarbon hybrid materials
- Covers five examples of applications for high performance ZnO-nanocarbons to light-emitting diodes, photovoltaics, piezoelectrics, and photoelectrochemical devices

This book offers a comprehensive overview of ZnO-nano carbon core shell hybrid issues. There is significant interest in metal oxide/nanocarbon hybrid functional materials in the field of energy conversion and storage as electrode materials for supercapacitors, Li ion secondary battery, electrocatalysts for water splitting, and optoelectronic devices such as light emitting diodes and solar photovoltaic cells. Despite efforts to manipulate more uniform metal oxide-nanocarbon nanocomposite structures, they have shown poor performance because they are randomly scattered and non-uniformly attached to the nanocarbon surface. For higher and more effective performance of the hybrid structure, 3D conformal coating on metal oxides are highly desirable. In the first part of the book, the physical and chemical properties of ZnO and nanocarbons and the state-of-the-art in related research are briefly summarized. In the next part, the 3D conformal coating synthetic processes of ZnO templated nanocarbon hybrid materials such as ZnO-graphene,-C60, single-walled (SWCNT) are introduced with the aid of schematic illustrations. Analysis of their chemical bonding and structure are also presented.

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