

Two-Dimensional Nanostructures for Energy-Related Applications

Editor

Kuan Yew Cheong

School of Materials & Mineral Resources Engineering
Engineering Campus, Universiti Sains Malaysia
Pulau Pinang
Malaysia



CRC Press

Taylor & Francis Group

Boca Raton London New York

CRC Press is an imprint of the
Taylor & Francis Group, an **Informa** business

A SCIENCE PUBLISHERS BOOK

Contents

<i>Preface</i>	v
1. Supercapacitors and Oxygen Reduction Reaction Catalysts Based on Graphene, MoS₂ and Related Layered Materials <i>K. Gopalakrishnan and C. N. R. Rao</i>	1
2. Layer-Structured Thermoelectric Materials: Fundamentals, Strategies and Progress <i>Zhi-Gang Chen and Jin Zou</i>	23
3. Thermoelectric Properties of Organic and Inorganic Materials and Cells <i>Khasan S. Karimov, Muhammad Abid, Kuan Yew Cheong and Muhammad Mehran Bashir</i>	48
4. Graphene Applications in Optoelectronic Devices <i>Lung-Chien Chen and Jia-Ren Wu</i>	99
5. Epitaxial Growth of III-Nitrides on Si Substrates for Highly-Efficient LED Application <i>Guoqiang Li, Wenliang Wang and Yunhao Lin</i>	119
6. Understanding the Role of CVD Nanodiamond Thin Films in Solar Energy Conversion <i>M. A. Fraga, L. A. A. Rodriguez, R. S. Pessoa and V. J. Trava-Airoldi</i>	152
7. A Discussion on the Use of Metal-Containing Diamond-Like Carbon (Me-DLC) Films as Selective Solar Absorber Coatings <i>M. A. Fraga, G. Leal, M. Massi and V. J. Trava-Airoldi</i>	178
8. ZnO Thin Films: The Most Potential Semiconductor Material as Buffer Layers in Thin Film Solar Cells <i>Nowshad Amin, Jamilah Husna and Mohammad Mezbaul Alam</i>	212

9. Formation of Nanoporous α-Fe₂O₃ Thin Film as Photoanode by Anodic Oxidation on Iron	240
<i>Monna Rozana, Atsunori Matsuda, Go Kawamura, Wai Kian Tan and Zainovia Lockman</i>	
10. Synthesis Processes, Characterization Methods and Energy Related Applications of Nano-Crystalline Titanium Dioxide	269
<i>Sanjeev K. Gupta, Abhinav Sharma and A. K. Garg</i>	
11. Design of ZnO Nano-Architectures and Its Applications	296
<i>Wai Kian Tan, Go Kawamura and Atsunori Matsuda</i>	
12. Thermally Grown Native Oxide Thin Films on SiC	332
<i>Banu Poobalan and Kuan Yew Cheong</i>	
13. Formation, Growth Mechanism and Electronic Structures of Ge Films on Si Substrates	377
<i>Yoshitaka Fujimoto</i>	
<i>Index</i>	401