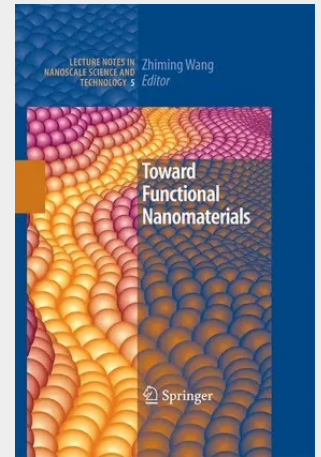


Toward Functional Nanomaterials

Advanced probes and new fabrication techniques enable nanomaterials to pervade multiple disciplines, including physics, chemistry, engineering and biology. Nanomaterials have been extensively investigated with various kinds of morphologies (nanoparticles, nanowhiskers, nanorods, nanowires, nanoclusters, quantum dots, etc.) and compositions (semiconductor, metal, polymer, etc.). Impressive progress has been made on directed assembly and synthesis, structure, and property characterization, as well as nanoscale device concepts and performance by a diverse group of experts. However, in spite of continued advancements in various aspects of functional nanomaterials, numerous challenges must still be overcome at different stages for practical applications to be realized. It seems that there is a need for a book in which individual research groups comprehensively review their up-to-date efforts and simulate further developments in other laboratories. Therefore, I believe that this book, which consists of twelve chapters from nine countries, is a timely undertaking. "Fabrication of Oxide Nanoparticles by Ion Implantation and Thermal Oxidation" is an in-depth review of the formation of oxide nanoparticles by metal ion implantation and subsequent thermal oxidation. Amekura and Kishimoto believe that there is a potential for an "embedded" breakthrough in the field of oxide nanoparticles similar to "Hache's finding of a breakthrough" in the field of metal nanoparticles. In "Design of Solution-Grown ZnO Nanostructures", Pauporte reviews significant progress toward the growth of well-controlled ZnO nanostructures in solution. He argues that solution-based methods are cost-effective and that the resulting nanostructures are easy to scale up for applications.

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160,49 €

149,99 € (zzgl. MwSt.)

Lieferfrist: bis zu 10 Tage

Artikelnummer: 9781489984845

Medium: Buch

ISBN: 978-1-4899-8484-5

Verlag: Humana

Erscheinungstermin: 13.11.2014

Sprache(n): Englisch

Auflage: 2009

Serie: Lecture Notes in Nanoscale Science and Technology

Produktform: Kartoniert

Gewicht: 744 g

Seiten: 483

Format (B x H): 155 x 235 mm

