## Contents

Preface	vii
Graphene Encapsulated Gold Nanoparticles and Their Characterization Junchi Wu and Nitin Chopra	1
A Surfactant-Assisted Solid-State Synthesis of $BaTiO_3$ from $BaCO_3$ and $TiO_2$ Yu-Lun Chang, and Hsing-I Hsiang	9
Morphological Stability of Gold Nanoparticles on Titania Nanoparticles M. Nahar and D. Kovar	23
Synthesis of Nanostructured Mesoporous Ordered Silica Supported Fe <sub>2</sub> O <sub>3</sub> Nanoparticles for Water Purification Sawsan A. Mahmoud and Heba M. Gobara	31
Patterning by Focused Ion Beam Assisted Anodization J. Zhao, K. Lu, B. Chen, and Z. Tian	47
Agricultural-Waste Nano-Particle Synthesis Templates for Hydrogen Storage William L. Bradbury and Eugene A. Olevsky	57
Synthesis, Structural and Mechanical Characterization of Artificial Nanocomposites Yong Sun, Zaiwang Huang, and Xiaodong Li	69
Properties of Freeze-Casted Composites of Silica and Kaolinite J. Walz and K. Lu	79

Controlled Processing of Bulk Assembling of Nanoparticles of Titania M. Jitianu, J. K. Ko, S. Miller, C. Rohn, and R. A. Haber	87
Phase Transition and Consolidation of Colloidal Nanoparticles Yoshihiro Hirata, Naoki Matsunaga, and Soichiro Sameshima	101
Thin Film Nanocomposites for Thermoelectric Applications Otto J. Gregory, Ximing Chen, Matin Amani, Brian Monteiro, and Andrew Carracia	113
Indium Tin Oxide Nanosized Transparent Conductive Thin Films Obtained by Sputtering from Large Size Planar and Rotary Targets E. Medvedovski, C.J. Szepesi, O. Yankov, and P. Lippens	125
Engineered Oxide Nanofilms Prepared from Solutions at Relatively Low Temperatures Arvid Pasto, Michael Pozvonkov, Morgan Spears, Evan Hyde, and Mark Deininger	147
Experimental Study of Structural Zone Model for Composite Thin Films in Magnetic Recording Media Application Hua Yuan and David E. Laughlin	161
Process Optimization of Ion Plating Nickel-Copper-Silver Thin Film Deposition Mike Danyluk	169
Author Index	187