

Table of Contents

SECTION I Powder Synthesis and Characterization

Chapter 1 Hydrothermal Synthesis of Ceramic Oxide Powders3

Shigeyuki Somiya, Rustum Roy, and Sridhar Komarneni

Chapter 2 Solvothermal Synthesis21

Masashi Inoue

Chapter 3 Mechanochemical Synthesis of Ceramics65

Aaron C. Dodd

Chapter 4 Cryochemical Synthesis of Materials77

Oleg A. Shlyakhtin, Nickolay N. Oleynikov, and Yuri D. Tretyakov

Chapter 5 Environmentally Benign Approach to Synthesis of
Titanium-Based Oxides by Use of Water-Soluble Titanium
Complex.....139

Koji Tomita, Deepa Dey, Valery Petrykin, and Masato Kakihana

Chapter 6 Peroxonioibium-Mediated Route toward the
Low-Temperature Synthesis of Alkali Metal Niobates
Free from Organics and Chlorides.....161

Deepa Dey and Masato Kakihana

Chapter 7 Synthesis and Modification of Submicron Barium
Titanate Powders173

*Burtrand I. Lee, Xinyu Wang, D.H. Yoon, Prerak Badheka, Lai Qi,
and Li-Qiong Wang*

Chapter 8 Magnetic Particles: Synthesis and Characterization.....193

Masataka Ozaki

Chapter 9 Synthesis and Surface Modification of Zinc Sulfide-Based Phosphors.....	217
--	-----

Lai Qi, Burtrand I. Lee, David Morton, and Eric Forsythe

Chapter 10 Characterization of Fine Dry Powders.....	233
---	-----

Hendrik K. Kammler and Lutz Mädler

SECTION II Powder Processing at Nanoscale

Chapter 11 Theory and Applications of Colloidal Processing.....	269
--	-----

Wolfgang Sigmund, Georgios Pyrgiotakis, and Amit Daga

Chapter 12 Nano/microstructure and Property Control of Single and Multiphase Materials	303
---	-----

Philippe Colomban

Chapter 13 Nanocomposite Materials.....	341
--	-----

Sridhar Komarneni

Chapter 14 Molecular Engineering Route to Two Dimensional Heterostructural Nanohybrid Materials.....	369
---	-----

Jin-Ho Choy and Man Park

Chapter 15 Nanoceramic Particulates for Chemical Mechanical Planarization in the Ultra Large Scale Integration Fabrication Process.....	393
--	-----

Ungyu Paik, Sang Kyun Kim, Takeo Katoh, and Jea Gun Park

SECTION III Sol-Gel Processing

Chapter 16 Chemical Control of Defect Formation During Spin-Coating of Sol-Gels.....	411
---	-----

Dunbar P. Birnie, III

Chapter 17 Preparation and Properties of SiO ₂ Thin Films by the Sol-Gel Method Using Photoirradiation and Its Application to Surface Coating for Display	421
---	-----

Tomoji Ohishi

SECTION IV Ceramics Via Polymers

Chapter 18 Organosilicon Polymers as Precursors for Ceramics	439
---	-----

Markus Weinmann

Chapter 19 Polymer Pyrolysis.....	491
--	-----

Masaki Narisawa

SECTION V Processing of Specialty Ceramics

Chapter 20 Chemical Vapor Deposition of Ceramics.....	511
--	-----

Guozhong Cao and Ying Wang

Chapter 21 Ceramic Photonic Crystals: Materials, Synthesis, and Applications.....	543
--	-----

Jeffrey DiMaio and John Ballato

Chapter 22 Tailoring Dielectric Properties of Perovskite Ceramics at Microwave Frequencies.....	571
--	-----

Eung Soo Kim, Ki Hyun Yoon, and Burtrand I. Lee

Chapter 23 Synthesis and Processing of High-Temperature Superconductors	595
--	-----

Toshiya Doi

Chapter 24 Synthesis of Bone-Like Hydroxyapatite/Collagen Self-Organized Nanocomposites	613
--	-----

Masanori Kikuchi

Chapter 25 Ceramic Membrane Processing: New Approaches in Design and Applications	629
<i>André Ayrál, Anne Julbe, and Christian Guizard</i>	
Chapter 26 Ceramic Materials for Lithium-Ion Battery Applications	667
<i>Jeffrey P. Maranchi, Oleg I. Velikokhatnyi, Moni K. Datta, Il-Seok Kim, and Prashant N. Kumta</i>	
Chapter 27 Chemical Solution Deposition of Ferroelectric Thin Films	713
<i>Robert Schwartz, Theodor Schneller, Rainer Waser, and Harold Dobberstein</i>	
Index	743