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IN SCIENCE AND TECHNOLOGY IN CHINA

ADVANCED TOPICS IN SCIENCE AND TECHNOLOGY IN CHINA

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Junbai Li
(Editor)

Nanostructured Biomaterials

With 122 figures, mostly in color

 ZHEJIANG UNIVERSITY PRESS
浙江大学出版社

 Springer

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ISSN 1995-6819
Advanced Topics in Science and Technology in China

e-ISSN 1995-6827

ISBN 978-7-308-06601-3
Zhejiang University Press, Hangzhou

ISBN 978-3-642-05011-4
Springer Heidelberg Dordrecht London New York

e-ISBN 978-3-642-05012-1

Library of Congress Control Number: 2009936204

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Cover design: Frido Steinen-Broo, EStudio Calamar, Spain

Printed on acid-free paper

Springer is a part of Springer Science+Business Media (www.springer.com)

Preface

Nanostructured materials with designed biofunctions have been bringing rapid and significant changes in materials sciences. Nanostructured Biomaterials provides up-to-date reviews of different routes for the syntheses of new types of such materials and discusses their cutting-edge technological applications. The chemical synthesis and physicochemical preparation of nanosized materials are summarized with particular attention on the self-assembly of specific molecular and nanosized building blocks into functional nanostructures. The reviews mainly focus on potential applications of nanostructured materials in biology and medical sciences. The book is of general interest to a wide community of graduate students and researchers active in chemistry, materials science, engineering, biology, and physics.

Within the last decades, rapid advances in nanotechnology spurred great interest in nanostructured materials. In particular nanostructures with biofunctional properties are most promising, challenging traditional materials in many ways. Meanwhile a large variety of nanostructured artificial biomaterials with tailored morphologies and functionalities have been designed and fabricated.

In this book, we present recent achievements in the synthesis and application of nanostructured biomaterials. We will show our readers the exciting challenges in this unique research area and we hope to convince them of the many new research opportunities.

Silica-based mesoporous nanomaterials show remarkable potential as drug-delivery systems and biosensors. They are reviewed by Yang Yang and Junbai Li in Chapter 1. Natural substances possess sophisticated hierarchical structures. Yuanqing Gu and Jianguo Huang summarize in Chapter 2 how they are utilized as templates and/or scaffolds for the fabrication of nanostructured materials. In Chapter 3, Peiqin Tang and Jingcheng Hao introduce polyoxometalate-based hybrid nanomaterials, which are used especially for thin films formed by different deposition techniques. Nanometer-precise coatings of metal oxides on morphologically complex surfaces of natural cellulose substances are addressed in Chapter 4. It is shown how metal oxide, polymer, and protein-immobilized nanomaterials are produced by using “old-fashioned” biocellulose. In the last chapter, Yue Cui, Qiang He and Junbai Li describe functional nanomaterials that are synthesized by employing porous membranes as templates.

The editor thanks the editorial staff, Ms Xiaojia Chen, Mr Jianzhong You and Ms Ge Zhang, for their excellent professional support.

Acknowledgements

The work of Chapter 1 was supported by the National Key Project on Basic Research of China (No. 2009CB930101).

The work of Chapter 2 was supported by the National Key Project on Basic Research of China (No. 2009CB930104).

The work of Chapter 3 was supported by the National Natural Science Foundation of China (Grant No. 20625307) and the National Key Project on Basic Research of China (No. 2009CB930103).

Most of Jianguo Huang's own research works presented here were done in Prof. Toyoki Kunitake's laboratory and under his guidance in RIKEN, Japan. The work of Chapter 4 was supported by the National Key Project on Basic Research of China (No. 2009CB930104).

Junbai Li
Beijing, China
August 2009

Contents

1 Silica-based Nanostructured Porous Biomaterials	1
1.1 Introduction.....	1
1.2 Silica Porous Materials in Drug Release Systems.....	2
1.2.1 Conventional Delivery Systems.....	2
1.2.2 Silica Porous Materials for Release Systems.....	2
1.2.3 Various Mesoporous Silica in Drug Delivery Systems.....	3
1.2.4 Stimuli-responsive Mesoporous Silica for Delivery Systems.....	4
1.3 Mesoporous Silica Nanoparticles.....	9
1.3.1 MSNs for Biological Applications.....	9
1.3.2 Non-functionalized MSNs in Drug Release Systems.....	9
1.3.3 Inorganic Nanocrystals Capped MSNs.....	11
1.3.4 The “Nanocalves” on the Surface of MSNs.....	13
1.3.5 MSNs as Biomarkers.....	15
1.4 Polymer Coated MSNs.....	19
1.4.1 Polymer Coated MSNs through Physical Adsorption.....	19
1.4.2 Polymer Coated MSNs through Covalent Binding.....	22
1.5 Summary.....	24
References.....	25
2 Nanostructured Functional Inorganic Materials Templated by	
Natural Substances	31
2.1 Introduction.....	31
2.2 Metal Oxide Nanomaterials.....	33
2.2.1 Silica Nanomaterials.....	33
2.2.2 Titania Nanomaterials.....	41
2.2.3 Tin Oxide Nanomaterials.....	47
2.2.4 Alumina Nanomaterials.....	49
2.2.5 Zirconia Nanomaterials.....	50
2.2.6 Zinc Oxide Nanomaterials.....	51
2.2.7 Other Examples.....	52
2.3 Metallic Materials.....	53

2.3.1	Nanostructured Gold.....	53
2.3.2	Nanostructured Silver.....	57
2.3.3	Nanostructured Platinum.....	59
2.3.4	Nanostructured Nickel.....	60
2.3.5	Nanostructured Copper.....	60
2.3.6	Nanostructured Metallic Arrays.....	60
2.3.7	Complex Metallic Materials.....	61
2.3.8	Other Examples.....	62
2.4	Quantum Dots.....	63
2.5	Silica Carbide Materials.....	66
2.6	Materials Fabricated by Organic Coating.....	67
2.7	Other Natural Substance-derived Materials.....	69
2.8	Summary.....	71
	References.....	72
3	Inorganic-organic Hybrid Materials Based on Nano- polyoxometalates and Surfactants.....	83
3.1	Introduction to Developed POMs.....	83
3.1.1	Structures of POMs.....	84
3.1.2	Properties of POMs.....	85
3.1.3	Applications of POMs.....	88
3.2	Inorganic-organic Hybrids of Polyoxometalates and Surfactants/Polyelectrolytes.....	90
3.2.1	Phase Behavior of Mixtures of POMs and Surfactants.....	90
3.2.2	Multilayer Films Containing POMs by Layer-by-layer Technique on Planar Substrates.....	95
3.2.3	Multilayer Films Containing POMs by Layer-by-layer Technique into Spherical Nanocapsules.....	102
3.2.4	Monolayer/Multilayer Films Incorporating POMs by Langmuir-Blodgett (LB) Technique.....	108
3.2.5	Three-dimensional Aggregates of POM-surfactant Hybrids.....	111
3.3	Self-assembled Honeycomb Films of Hydrophobic Surfactant- encapsulated Clusters (HSECs) at Air/Water Interface.....	115
3.3.1	Introduction to Honeycomb Films.....	116
3.3.2	Fabricating Honeycomb Films of HSECs at Air/Water Interface.....	117
3.3.3	Mechanism of Self-assembly of HSECs into Honeycomb Films.....	120

3.3.4	Morphology Modulation of Honeycomb Films of HSECs.....	121
3.4	Conclusions.....	125
	References.....	126
4	Natural Cellulosic Substance Derived Nanostructured Materials.....	133
4.1	Introduction.....	134
4.2	Natural Cellulosic Substances.....	135
4.3	Cellulose Derived Nanomaterials.....	137
4.3.1	Titania Nanotubular Materials.....	138
4.3.2	Zirconia Nanotubular Materials.....	141
4.3.3	Tin Oxide Nanotubular Materials.....	141
4.3.4	Indium Tin Oxide Nanotubular Materials.....	144
4.3.5	Hybrid of Titania Nanotube and Gold Nanoparticle.....	148
4.3.6	Hierarchical Polypyrrole Nanocomposites.....	150
4.3.7	Protein Immobilization on Cellulose Nanofibers.....	152
4.3.8	Natural Cellulose Substance Derived Hierarchical Polymeric Materials.....	154
4.3.9	Metal-coated Cellulose Fibers.....	157
4.3.10	Hierarchical Titanium Carbide from Titania-coated Cellulose Paper.....	158
4.4	Summary.....	160
	References.....	160
5	Nanoporous Template Synthesized Nanotubes for Bio-related Applications.....	165
5.1	Introduction.....	165
5.2	Porous Templates.....	166
5.3	Preparation of Composite Nanotubes in Porous Template.....	168
5.3.1	LbL-assembled Polymeric Nanotubes.....	168
5.3.2	Nanotubes Bases on Sol-gel Chemistry.....	178
5.3.3	Nanotubes Synthesized by Polymerization.....	180
5.4	Functional Composite Nanotubes towards Biological Applications.....	185
5.4.1	Biofunctional and Biodegradable Nanotubes.....	185
5.4.2	Nanotubes for Biosensors and Bioseparation.....	188
5.4.3	Nanotubes for Drug and Gene Delivery.....	191
5.5	Summary.....	193
	References.....	194
	Index.....	201

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