

Contents

Volume 1

1 Properties of Carbon Nanotubes	1
Marc Monthieux, Emmanuel Flahaut, Christophe Laurent, Walter Escoffier, Bertrand Raquet, Wolfgang Bacsa, Pascal Puech, Bruno Machado, and Philippe Serp	
2 Electronic Properties of Si and Ge Pure and Core-Shell Nanowires from First Principle Study	51
Xihong Peng, Fu Tang, and Paul Logan	
3 Compositionally Graded III-Nitride Nanowire Heterostructures: Growth, Characterization, and Applications	85
Santino D. Carnevale and Roberto C. Myers	
4 Mechanical Characterization of Graphene	121
Changhong Cao, Xuezhong Wu, Xiang Xi, Tobin Filleter, and Yu Sun	
5 Nanostructured ZnO Materials: Synthesis, Properties and Applications	137
Valentina Cauda, Rossana Gazia, Samuele Porro, Stefano Stassi, Giancarlo Canavese, Ignazio Roppolo, and Alessandro Chiolerio	
6 Nanosized Gold and Silver Spherical, Spiky, and Multi-branched Particles	179
Stefano Stassi, Valentina Cauda, Giancarlo Canavese, Diego Manfredi, Ignazio Roppolo, Paola Martino, and Alessandro Chiolerio	
7 Magnetite and Other Fe-Oxide Nanoparticles	213
Alessandro Chiolerio, Angelica Chiodoni, Paolo Allia, and Paola Martino	
8 Hierarchical Self-Assembled Peptide Nano-ensembles	247
Priyadharshini Kumaraswamy, Swaminathan Sethuraman, Jatinder Vir Yakhmi, and Uma Maheswari Krishnan	

9	Nanostructure Formation in Hydrogels	285
	Seyedsina Moeinzadeh and Esmail Jabbari	
10	Nanomanipulation and Nanotribology of Nanoparticles and Nanotubes Using Atomic Force Microscopy	299
	Dave Maharaj and Bharat Bhushan	
11	Fabrication, Properties and Applications of Gold Nanopillars . . .	317
	Dorothea Brüggemann, Bernhard Wolfrum, and Johann P. de Silva	
12	Stabilization and Characterization of Iron Oxide Superparamagnetic Core-Shell Nanoparticles for Biomedical Applications	355
	Erik Reimhult and Esther Amstad	
13	Bio-inorganic Nanomaterials for Biomedical Applications (Bio-silica and Polyphosphate)	389
	Werner E. G. Müller, Olga Albert, Heinz C. Schröder, and Xiaohong H. Wang	
14	Lipids as Biological Materials for Nanoparticulate Delivery	409
	Indu Pal Kaur, Rohit Bhandari, and Jatinder Vir Yakhmi	
15	Magnetic Nanoparticles for Biomedical Applications	457
	Manuel Bañobre-López, Y. Piñeiro, M. Arturo López-Quintela, and José Rivas	
16	Mechanical Properties of Nanostructured Metals	495
	Peter M. Anderson, John S. Carpenter, Michael D. Gram, and Lin Li	
17	Properties of Diamond Nanomaterials	555
	Tad Whiteside, Clifford Padgett, and Amanda McGuire	
18	Sensing the Mechanical Properties of Supported Micro- to Nano-elastic Films	575
	Frédéric Restagno, Emmanuelle Martinot, Richar Villey, S. Leroy, Christophe Poulard, Elisabeth Charlaix, and Liliane Léger	
19	Metal Structures as Advanced Materials in Nanotechnology	615
	Angelo Accardo, Remo Proietti Zaccaria, Patrizio Candeloro, Francesco Gentile, Maria Laura Coluccio, Gobind Das, Roman Krahne, Carlo Liberale, Andrea Toma, Simone Panaro, Ermanno Miele, Manohar Chirumamilla, Vijayakumar Rajamanickam, and Enzo Di Fabrizio	
20	Metal Oxide Nanocrystals and Their Properties for Application in Solar Cells	671
	Ashish Dubey, Jiantao Zai, Xuefeng Qian, and Qiquan Qiao	

Volume 2

21	Carbon Nanomaterials: A Review	709
	Nitin Choudhary, Sookhyun Hwang, and Wonbong Choi	
22	Carbon Nanostructures for Enhanced Photocatalysis for Biocidal Applications	771
	Georgios Pyrgiotakis	
23	Electrospun Functional Nanofibers and Their Applications in Chemical Sensors and Li-Ion Batteries	793
	Il-Doo Kim, Seon-Jin Choi, and Won-Hee Ryu	
24	Mesoporous Transition Metal Oxide Ceramics	839
	Massey de Los Reyes and Peter Majewski	
25	Properties of Ferroic Nanomaterials	871
	Jennifer S. Andrew	
26	Segregation-Induced Low-Dimensional Surface Structures in Oxide Semiconductors	891
	A. J. Atanacio, Tad Bak, Dewei Chu, Mihail Ionescu, and Janusz Nowotny	
27	Biofunctionalization of Nanoporous Alumina Substrates	911
	Thomas D. Lazzara, Andreas Janshoff, and Claudia Steinem	
28	Computational Materials Science of Bionanomaterials: Structure, Mechanical Properties and Applications of Elastin and Collagen Proteins	941
	Anna Tarakanova, Shu-Wei Chang, and Markus J. Buehler	
29	Handbook of Nanomaterials Properties: Siliceous Nanobiomaterials	963
	Wei Han, Linnea K. Ista, Gautam Gupta, Linying Li, James M. Harris, and Gabriel P. López	
30	High-Throughput Screening for the Production of Biomaterials: A New Tool for the Study of the Interactions Between Materials and Biological Species	995
	Si Amar Dahoumane, Blake-Joseph Helka, Mathieu Artus, Brandon Aubie, and John D. Brennan	
31	Mapping the Stiffness of Nanomaterials and Thin Films by Acoustic AFM Techniques	1023
	Stefan Zauscher, Zehra Parlak, and Qing Tu	
32	Nanomaterials as Antimicrobial Agents	1053
	Martin Malmsten	

33	Nanomechanics of Single Biomacromolecules	1077
	Qing Li, Zackary N. Scholl, and Piotr E. Marszalek	
34	Properties of DNA	1125
	Ronnie Pedersen, Alexandria N. Marchi, Jacob Majikes, Jessica A. Nash, Nicole A. Estrich, David S. Courson, Carol K. Hall, Stephen L. Craig, and Thomas H. LaBean	
35	Aptamer-Functionalized Nanomaterials for Biological and Biomedical Applications	1159
	Yike Huang and Yong Wang	
36	Electrical and Optical Enhancement Properties of Metal/Semimetal Nanostructures for Metal Oxide UV Photodetectors	1177
	Shayla Sawyer and Dali Shao	
37	Photothermal Properties of Hollow Gold Nanostructures for Cancer Theranostics	1199
	Liangran Guo, Yajuan Li, Zeyu Xiao, and Wei Lu	
38	Properties of DNA-Capped Nanoparticles	1227
	Wenjuan Yang, Yi Chen, and Wenlong Cheng	
39	Properties of Quantum Dots: A New Nanoprobe for Bioimaging	1263
	Chunyan Li, Bohua Dong, and Qiangbin Wang	
40	Dental Composites Reinforced with Ceramic Whiskers and Nanofibers	1299
	Xiaoming Xu and Hockin H. K. Xu	
41	Elastic, Viscoelastic, and Fracture Properties of Bone Tissue Measured by Nanoindentation	1321
	Do-Gyoon Kim and Kathy L. Elias	
42	Modulating Protein Adhesion and Conformation with Block Copolymer Surfaces	1343
	Scott R. Schricker, Manuel Palacio, and Bharat Bhushan	
43	Nanofillers in Restorative Dental Materials	1377
	Sarah S. Mikhail, Shereen S. Azer, and Scott R. Schricker	
44	Nanostructured Multiphase Polymer Networks	1443
	Carmem S. Pfeifer	