660 MAT

CONTENTS

THE SOCIETAL AND EDUCATIONAL CONTEXT

1.	Government, Academic, and Industrial Issues	3
	Critical Technologies and U.S. Competitiveness: The Materials Connection	4
	Materials Science and Engineering for the 1990s: A National Academies Study	12
	The National Science Foundation's Program in Materials Science: New Frontiers,	
	New Initiatives, New Programs, and New Prospects	18
	Development and Commercialization of Advanced-Performance Materials	28
	Partnerships with Universities	37
2.	Educational Issues	43
	Materials Education for and by Chemists	44
	Industrial Perspective on Materials Chemistry Education	55
	Funding Opportunities for Materials Science Education	60
	Chemistry of Materials Courses at Rensselaer Polytechnic Institute	62
	New Curricular Materials for Introducing Polymer Topics in Introductory Chemistry	
	Courses	66
	General Chemistry as a Curriculum Pressure Point: Development of Teaching General	
	Chemistry: A Materials Science Companion	71
	How Scientists and Engineers Can Enhance Science Education in Grades K-12	76

SELECTED RESEARCH TOPICS

3.	New Direction in the Design of Lithographic Resist Materials: A Case Study	85
4.	High-Conductivity, Solid Polymeric Electrolytes	107
5.	Preceramic Polymers: Past, Present, and Future	131
6.	Molecular Magnets: An Emerging Area of Materials Chemistry	161
7.	Optimization of Microscopic and Macroscopic Second-Order Optical Nonlineraities	189
8.	Materials Chemistry of Organic Monolayer and Multilayer Thin Films	211
9.	Orientation-Dependent NMR Spectroscopy as a Structural Tool for Layered Materials	231
10.	Nanoscale, Two-Dimensional Organic-Inorganic Materials	259
11.	Nanoporous Layered Materials	283
12.	Catalytic Materials	301
13.	Molecular Sieves for Air Separation	321
14.	Nanomaterials: Endosemiconductors and Exosemiconductors	335
15.	Molecule-Based Syntheses of Extended Inorganic Solids	373

16.	Organometallic Chemical Vapor Deposition of Compound Semiconductors:		
	A Chemical Perspective	397	
17.	Interfaces, Interfacial Reactions, and Superlattice Reactants	425	
18.	Oxide Superconductors	471	
19.	Characterization of Complex Materials by Scanning Tunneling Microscopy:		
	A Look at Superconductors with High Critical	479	
20.	Biomimetic Mineralization	509	
21.	Inorganic Biomaterials	523	

INDEX

Author Index	551
Affiliation Index	551
Subject Index	552