

CONTENTS

Preface	xiii
1. Recent Advances in Inorganic and Organometallic Polymers: An Overview	1
SILICON-CONTAINING POLYMERS	
2. Anionic Polymerization of Masked Disilenes to Polysilanes: Mechanism and Applications	8
3. Electrochemical Access to Di-, Tri-, and Polysilanes	18
4. Stereostructure of Polysilanes by Ring-Opening Polymerization	32
5. Polysilazane Thermosets as Precursors for Silicon Carbide and Silicon Nitride	43
6. Substituent Effects on UV Absorption of σ -Conjugated Polysilanes	55
7. Poly(dimethylsiloxane)-Urea-Urethane Copolymers: Synthesis and Surface Properties	64
8. Silicon-Containing Resist Materials Based on Chemical Amplification	81
9. Some Silicon Polymers of C ₆₀ (Buckminsterfullerene)	92
OXOPOLYMERS	
10. Structure-Property Relationships in Sol-Gel-Derived Thin Films	104
11. Plasma Oxidation of Hydrocarbon Templates in Bridged Polysilsesquioxanes: Porous Materials by Design	122
12. Sol-Gel Synthesis of Heterometallic Oxopolymers	134
13. Reaction of Boehmite with Carboxylic Acids: New Synthetic Route to Alumoxanes	149
14. Alucone Polymers and Their Pyrolytic Product Aluminum Oxides	165
15. Sol-Gel-Based Inorganic-Organic Composite Materials	183
16. Synthesis of Nanocomposite Materials via Inorganic Polymer Gels	195
POLYPHOSPHAZENES	
17. Macromolecular and Materials Design Using Polyphosphazenes	208
18. Synthesis of Poly(alkyl/arylphosphazenes) and Their Precursors	232
19. Derivatives of Poly(alkyl/arylphosphazenes)	246
20. Polyphosphazene Molecular Composites: In Situ Polymerizations of Silicon, Titanium, Zirconium, and Aluminum Alkoxides	258
21. Oxygen Gas Permeability and the Mechanical Properties of Poly(<i>n</i> -butylamino)(di- <i>n</i> -hexylamino)phosphazene Membranes	268
22. Grafting Reactions onto Poly(organophosphazenes)	279
23. Poly[bis(<i>p</i> -chlorophenoxy)phosphazene]-Polystyrene Blends: Preparation, Compatibility, and Properties	295
24. Polyphosphazene Random and Block Copolymers with Alkoxyalkoxy and Trifluoroethoxy Side Groups	311
25. Photophysics and Photochemistry of Poly(methyl-phenylphosphazene) and Poly(methylphenyl-phosphazene)- <i>graft</i> -polystyrene Copolymers	324

MAIN GROUP ELEMENT POLYMERS

26. Poly(alkyl/aryloxothiazenes), [N=S(O)R] _n : New Direction in Inorganic Polymers	344
27. Recent Developments in Borazine-Based Polymers	358
28. Synthesis and Preceramic Applications of Poly(aminoborazinyls)	375
29. Copolymerization Reactions of Inorganic Rings Containing Olefinic Substituents: Quantitative Reactivity Studies	389
30. Synthesis of Organoboron Polymers by Hydroboration Polymerization	398
31. Poly(carborane-siloxane-acetylene) as Precursor to High-Temperature Thermoset and Ceramic	416
32. Organoaluminum Precursor Polymers for Aluminum Nitride Ceramics	427

METAL-CONTAINING POLYMERS

33. Ring-Opening Polymerization of Strained, Ring-Tilted Metallocenophanes: New Route to Polymers Based on Transition Metals	442
34. New Organometallic Polymeric Materials: Search for $\chi^{(2)}$ Nonlinear Optical Organometallic Polymers	456
35. Transition Metallophthalocyanines as Structures for Materials Design	472
36. New Class of Photochemically Reactive Polymers Containing Metal-Metal Bonds Along the Polymer Backbone; Synthesis, Characterization, and Reactivity	481
37. Structural and Spectroscopic Studies of β -Hematin(the Heme Coordination Polymer in Malaria Pigment)	497

INDEXES

Author Index	519
Affiliation Index	520
Subject Index	521