

TABLE OF FIGURES

I	Controlled/"Living" Free Radical Polymerizations	
Figure 1	General Grafting Mechanism.s.....	14
Figure 2	Langmuir-Blodgett Immobilization Representation.....	17
Figure 3	Surface Bound Nitroxide Initiating Groups.....	19
Figure 4	TGA of Grafted Polystyrene on Silica Gel.....	26
Figure 5	TGA of Initiator-Functionalized Silica Gel.....	28
II	Supramolecular Assemblies	
Figure 1	Various Covalent Polymeric Architectures.....	37
Figure 2	Random, Alternating, and Block Copolymer Sequencing.....	39
Figure 3	Non-covalent Polymer Topologies.....	40
Figure 4	Pseudorotaxanes, Rotaxanes, and Catenanes.....	42
Figure 5	Complexation of <i>t</i> -Butylamine by 2-carboxy-1,3-phenylene-18-Crown-6.....	45
Figure 6	Various Conformations of 18-crown-6.....	47
Figure 7	Molecular Structures of 18-Crown-6, Valinomycin, and [2.2.2]-Cryptand.....	49
Figure 8	Space Filling Diagram Illustrating the Cradled Barbell Structure.....	50
Figure 9	Crown Ether Donor Atom Association Strength Influences.....	52
Figure 10	Cyanuric Acid and Melamine Two-Dimensional Network.....	53
Figure 11	Two Common Exchange Rate Regimes in Supramolecular Assembly Formation.....	56

Figure 12	Representative van't Hoff Plot for the Complexation of diester BMP32C10 with Paraquat Diol.....	67
Figure 13	Representative ¹ H NMR for the Complexation of Cryptand 10 with Dimethyl Paraquat.....	80
III	Polymeric Supramolecular Assemblies	
Figure 1	Representative Dendrophane.....	96
Figure 2	Benzamidinium Guests, Which Bind to Naphthyridine Cores.....	96
Figure 3	Ferrocene Functionalized Dendrimers.....	99
Figure 4	First Generation 'Crowned' Arborol.....	101
Figure 5	¹ H NMR of DAB <i>dend</i> (24C8) ₄ + Dibenzyl Ammonium (PF ₆).....	108
Figure 6	Titration Curves for the Binding of DAB <i>dend</i> (24C8) _n with Dibenzyl Ammonium (PF ₆).....	109
Figure 7	Acid as a Cofactor of Amine Binding.....	110
Figure 8	MALDI TOF MS of a Mixture of DAB <i>dend</i> (24C8) ₄ + Dibenzyl Ammonium (PF ₆).....	111
Figure 9	2D NOESY of a Mixture of DAB <i>dend</i> (24C8) ₆₄ + Dibenzyl Ammonium (PF ₆).....	112
Figure 10	Scatchard Plots for the Binding of Protonated DAB <i>dend</i> (24C8) _n with Dibenzyl Ammonium (PF ₆).....	115
Figure 11	Hill Plots for the Binding of Protonated DAB <i>dend</i> (24C8) _n with Dibenzyl Ammonium (PF ₆).....	116
Figure 12	Switching Mechanism of a Mixture of DAB <i>dend</i> (24C8) ₁₆ with Dibenzyl Ammonium (PF ₆).....	119
Figure 13	Scatchard Plots for the Binding of Paraquat Diol (2 PF ₆) by DAB <i>dend</i> (32C10) _n	129
Figure 14	Hill Plots for the Binding of Paraquat Diol (2 PF ₆) by DAB <i>dend</i> (32C10) _n	129

Figure 15	^1H NMR of Protonated DAB dend $(32\text{C}10)_{16}$ Upon Complexation with Paraquat Diol (2PF_6)	132
Figure 16	Scatchard Plots for the Binding of Paraquat Diol (2PF_6) by Protonated DAB dend $(32\text{C}10)_{16}$	133
Appendix I	The Importance of Binding Constants: Theory, Models, and Discussion	
Figure 1	Representative Binding Curves for Various Models.....	145
Figure 2	Approximate Relative Error in One-Site Binding.....	148
Figure 3	Hypothetical Hill Plot for Binding of O_2 to a Single Hemoglobin Strand.....	155
Figure 4	Hypothetical Hill Plot for Binding of 16 Guest Molecules to a Single Host Bearing 16 Receptor Sites.....	155