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BAYER CHAIR PROFESSOR AND EXECUTIVE OFFICER
DEPARTMENT OF CHEMICAL ENGINEERING
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- EDUCATION:** **Harvard University** Cambridge, MA
Postdoctoral Fellow, September 1993 - January 1995
Advisor: G. M. Whitesides, Chemistry Department
- Massachusetts Institute of Technology** Cambridge, MA
Ph.D., Chemical Engineering, June 1993
Program in Polymer Science and Technology Fellow, 1988-89
Thesis Title: The Synthesis, Characterization and Optical Properties of Novel Diacetylene-Containing Aromatic Liquid Crystalline Polymers.
Advisor: M. F. Rubner, Dept. of Materials Science and Engineering
- Georgia Institute of Technology** Atlanta, GA
M.S., Chemical Engineering, August 1988
Thesis Title: Development of a Conductive Elastomeric Matrix for Robotic Tactile Sensors.
Advisors: A.S. Abhiraman, J.W. Gooch
- Massachusetts Institute of Technology** Cambridge, MA
B.S., Chemical Engineering, June 1984.

ACADEMIC POSITIONS:

Massachusetts Institute of Technology
Full Professor, Bayer Chair Professorship 2006-present
Mark Hyman, Jr. Associate Chair Professor 2003 - 2006
Associate Professor with Tenure 2002 - 2006
Joseph P. Mares Associate Chair Professor of Chemical Engineering 2000- 2003
Associate Professor of Chemical Engineering 2000 - 2002
Herman P. Meissner Career Development Assistant Professor, 1995 - 2000

HONORS

- Distinguished Scientist Award, Harvard Foundation, Harvard University, 2010
- Melvin Calvin Lecturer, U.C. Berkeley Department of Chemistry, 2009
- Visiting Women's Scholar Award, University of Delaware, 2009
- William W. Grimes Award, AIChE, 2009
- Caltech Kavli Institute Lecturer, February 2009
- Fellow, American Institute of Medical and Biological Engineering (AIMBE), Elected 2009
- Fellow, American Physical Society, Elected 2006
- Melvin Calvin Lecturer, U.C. Berkeley Department of Chemistry, 2009
- Visiting Women's Scholar Award, University of Delaware, 2009
- William W. Grimes Award, AIChE, 2009
- Kavli Distinguished Lecturer, Caltech, 2009
- Bayer Chair Professorship, 2006-2010
- Finalist, World Technology Award for Energy, 2009
- Karl Kammermeyer Distinguished Lecture at Iowa State University, 2008
- Irwin Sizer Award for Significant Improvements to MIT Education, 2008

- Featured in “Top 100 Science Stories of 2008”, Discover Magazine, January 2009 for micropatterned virus batteries (*PNAS* 2008 w/Angela Belcher).
- Featured in Nature, The Economist, Forbes and Technology Review for methanol fuel cell PEM from polyelectrolyte multilayer nano-assembly (*Advanced Materials* 2008).
- Lucy Pickett Lecturer, Mt. Holyoke College, 2007
- Popular Mechanics Breakthrough Award (honors 10 innovations in science and technology), shared with Angela Belcher and Yet-Ming Chiang for Virus-Based Thin Film Battery, October 2006
- Member, National Research Council (NRC) Board on Chemical Sciences and Technology (invited appointee), 2006-2009
- Permanent Member, NIH Gene and Drug Delivery Study Group, 2006-2010
- Georgia Tech Outstanding Young Alumni Award, 2004
- Bayer Distinguished Lecturer, 2004
- Invited Radcliffe Institute Fellow (aka Bunting Fellow), Harvard University, 2003
- Mark Hyman, Jr. Associate Professor Career Chair
- Henry Hill Lecturer Award, NOBCCChE, 2004
- Joseph R. Mares Associate Professor Chair
- Junior Bose Faculty Award, 2000
- GenCorp Signature University Award 2000
- Lloyd Ferguson Young Scientist Award, 2000
- Invited Attendee, National Academy of Engineering Frontiers of Engineering Symposium
- NSF CAREER Award for Young Investigators, 1997
- Environmental Protection Agency Early Career Research Award, 1996
- 3M Innovation Research Award, 1996
- DuPont Young Faculty Research Award, 1996-1999
- Herman P. Meissner Career Development Chair 1995-1998
- NSF Postdoctoral Fellowship in Chemistry, 1994
- Ford Foundation Dissertation Fellowship, 1992
- Massachusetts Institute of Technology Karl Taylor Compton Prize Recipient, 1992
- Eastman Kodak Theophilus Sorrel Graduate Award Recipient, NOBCCChE, 1990

ADDITIONAL EXPERIENCE:

Harvard University

Cambridge, MA

Postdoctoral Fellow

September, 1993-January, 1995

NSF Postdoctoral Fellow in Chemistry, 1994

Postdoctoral studies with George M. Whitesides of the Harvard Chemistry Department. Used patterned self-assembled monolayers on gold to guide the deposition of metals, polymers, organic and inorganic dyes. Stamped micron scale features onto gold surfaces using alkanethiols. The monolayers served as templates or resists for the deposition of a wide range of materials in the production of microstructures.

Massachusetts Institute of Technology

Cambridge, MA

Research Assistant

June 1989 - June 1993

Research Experience:

Projects included extensive research of diacetylene-containing polyurethanes; synthesized polyurethanes and measured mechanical and optical properties such as mechanochromism as a function of degree of cross-polymerization of diacetylene groups. Designed and synthesized a series of main chain thermotropic liquid

crystalline aromatic polyesters containing the diacetylene group within the main chain repeat unit.

Georgia Tech Research Institute

Atlanta, GA

Research Engineer I

August, 1986 - August, 1988

Performed applied research and development in the Polymers Group. Developed a filled, conductive elastomer for use in robotic touch pads. Optimized elastomeric and electrical properties of material by adjusting overall polymer structure and formulation. Determined rheological characteristics and aided in formulation of magnetic tape coating systems. Investigated conversion of trioxane to polyglycolide.

Motorola, Inc.

Ft.Lauderdale, FL

Process Engineer I, II

July, 1984 - June, 1986

Maintained semiconductor packaging production area. Technologies include epoxy die attach, thermosonic wirebonding of integrated circuits, protective coating and covering of semiconductors. Developed and implemented new production processes which improved yield and increased throughput.

Dow Chemical Company

Midland, MI

Summer Intern

Summer, 1983

Developed grafted rubber latex used for ABS refrigeration resin. Operated lab scale batch reactor; produced, characterized, and optimized latex.

RESEARCH INTERESTS

- Macromolecular Design and Synthesis
- Self-organizing Polymer Systems
- Alternating Electrostatic Layer-by-Layer Assembly
- Polymeric Biomaterials
- Liquid Crystalline Polymers and Block Copolymers
- Dendrimers and Dendritic Block Copolymers

PROFESSIONAL SOCIETIES:

Member of the American Institute of Chemical Engineers (AIChE), the American Chemical Society (ACS), the American Physical Society (APS), the Materials Research Society (MRS), Sigma Xi and the National Organization for the Advancement of Blacks in Chemistry and Chemical Engineering (NOBCCChE), Society of Biological Engineers (SBE).

PROFESSIONAL SERVICE:

Organizing Committee, NSF Workshop on Polymer Science	2007
Member, NRC Board on Chemical Science and Technology	2006-2010
NIH Gene and Drug Delivery Study Section	2006-2010
AIChE MESD Vice Chair, MESD Programming Chair	2006-2007
Vice Chair, Polymer Group, AIChE,	November, 1999- 2001
Advisory Editorial Board, <i>Soft Matter</i>	January 2005-present
MRS Fall Meeting Chair,	December, 2003
Co-organizer, German-American Frontiers of Polymer Science	August 2003
Advisory Board, <i>Chemistry of Materials</i>	January 2002-present

Advisory Board, <i>Advanced Materials</i>	June 1997-present
ACS Symposium Chair, "Macromolecular Self Assembly at Surfaces and Interfaces", 2001	
MRS Symposium Organizer: "Nonlithographic Approaches To Ordered Structures", 1999	
ACS PMSE (Polymeric Mat. Sci. and Eng) Division Member-at-Large,	June 1998-present
ACS PMSE Ford Travel Grant Committee	June 1999-2003
Peer Panel, INEEL Polymer Membranes Program	Sept. 1999
NRC COSEPUP, Young Scientist Rep.	July 1994-Jan 1995

PUBLICATIONS:

Papers:

1. Z. Poon, S. Chen, A.C. Engler, H.I. Lee, E. Atas, G.V. Maltzahn, S.N. Bhatia and P.T. Hammond, "Ligand-clustered "patchy" nanoparticles for modulated cellular uptake and in vivo tumor targeting", *Angewandte Chemie*, Accepted.
2. B.-S. Kim, S.W. Lee, H. Yoon, M.S. Strano, Y. Shao-Horn, P.T. Hammond, "Pattern transfer printing of multi-walled carbon nanotube multilayers and application in biosensors", *Chemistry of Materials*, Accepted.
3. M.L. Macdonald, N.M. Rodriguez, P.T. Hammond, "Characterization of tunable FGF-2 releasing polyelectrolyte multilayers", *Biomacromolecules*, Accepted.
4. S.W. Lee, J. Kim, S. Chen, P.T. Hammond, Y. Shao-Horn, "Carbon Nanotube/Manganese Oxide Ultrathin Film Electrodes for Electrochemical Capacitors", *ACS Nano*, ASAP.
5. P.T. Hammond, "Particles release", *Nature Materials*, **9**, 292-293 (2010).
6. S.W. Lee, N. Yabuuchi, B.M. Gallant, S. Chen, B.-S. Kim, P.T. Hammond, Y. Shao-Horn "High-power lithium batteries from functionalized carbon-nanotube electrodes", *Nature Nanotechnology advance online publication* (2010).
7. J.S. Moskowitz, M.R. Blaisse, R.E. Samuel, H.-P Hsu, M.B. Harris, S.D. Martin, J.C. Lee, M. Spector, P.T. Hammond, "The effectiveness of the controlled release of gentamicin from polyelectrolyte multilayers in the treatment of *Staphylococcus aureus* infection in a rabbit bone model", *Biomaterials*, **31**, 6019-6030 (2010).
8. M.E. Yurchenko, J. Huang, A. Robisson, G.H. McKinley, P.T. Hammond, "Synthesis, mechanical properties and chemical/solvent resistance of crosslinked poly(aryl-ether-ether-ketones) at high temperatures", *Polymer*, **51**, 1914-1920 (2010).
9. S.Y. Wong, Q. Li, J. Veselinovic, B.-S. Kim, A.M. Klibanov, P.T. Hammond, "Bactericidal and virucidal ultrathin films assembled layer by layer from polycationic N-alkylated polyethylenimines and polyanions", *Biomaterials*, **31**, 4079-4087 (2010).
10. A. Shukla, K.E. Fleming, H.F. Chuang, T.M. Chau, C.R. Loose, G.N. Stephanopoulos and P.T. Hammond, "Controlling the release of peptide antimicrobial agents from surfaces", *Biomaterials*, **31**, 2348-2357 (2010).

11. A.A. Argun, J. N. Ashcraft, M.K. Herring, D.K.Y. Lee, H.R. Allcock and P.T. Hammond, and "Ion Conduction and Water Transport in Polyphosphazene-Based Multilayers", *Chemistry of Materials*, **22**(1), 226-232 (2010).
12. D.J. Schmidt, E.M. Pridgen, P.T. Hammond, J.C. Love, "Layer-by-Layer Assembly of a pH-Responsive and Electrochromic Thin Film" *Journal of Chemical Education*, **87**, 208-211 (2010).
13. L. Chen, L. Bromberg, J.A. Lee, H. Zhang, H. Schreuder-Gibson, P. Gibson, J. Walker, P.T. Hammond, T.A. Hatton, G.C. Rutledge, "Multifunctional Electrospun Fabrics via Layer-by-Layer Electrostatic Assembly for Chemical and Biological Protection" *Chemistry Materials*, **22**, 1429-1436 (2010).
14. P.T. Hammond, "Solutions for the Developing World", *ACS Nano Editorial*, **3**(9), 2431-2432 (2009).
15. P.T. Hammond, "Bridging Macro and Nano", *ACS Nano Editorial*, **3** (3), 485-486 (2009).
16. P.S. Weiss, D.A. Bonnelli, J.M. Buriak, P.A. Lewis, P.T. Hammond, N.A. Kotov, C.G. Willson, "Gaining Strength, Increasing Our Impact", *ACS Nano*, **3**, 3815-3816 (2009).
17. J.A. Lee, K.C. Krogman, M. Ma, R.M. Hill, P.T. Hammond, G.C. Rutledge, "Highly reactive multilayer-assembled TiO₂ coating on electrospun polymer nanofibers", *Advanced Materials*, **21** (12), 1252-1256 (2009).
18. A.C. Engler, H.I. Lee, and P.T. Hammond, "Highly Efficient "Grafting onto" a Polypeptide Backbone Using Click Chemistry", *Angewandte Chemie*, **48**, 9334-9338 (2009).
19. B.S. Kim, R.C. Smith, Z. Poon and P.T. Hammond, "MAD (Multiagent Delivery) Nanolayer: Delivering Multiple Therapeutics from Hierarchically Assembled Surface Coatings", *Langmuir*, **25**, 14086-14092 (2009).
20. R.C. Smith, M. Riollano, A. Leung, and P.T. Hammond, Layer-by-Layer Platform Technology for Small-Molecule Delivery, *Angewandte Chemie*, **48**, 8974-8977 (2009).
21. X.F. Su, B.S. Kim, S.R. Kim, P.T. Hammond and D.J. Irvine, "Layer-by-Layer-Assembled Multilayer Films for Transcutaneous Drug and Vaccine Delivery", *ACS Nano*, **3**, 3719-3729 (2009).
22. K.C. Krogman, J.L. Lowery, Nicole S. Zacharia, G.C. Rutledge, and P.T. Hammond, "Spraying Asymmetry into Functional Membranes Layer-by-Layer", *Nature Materials*, **8**, 512-518 (2009).
23. B.S. Kim, H-I. Lee, Y. Min, Z. Poon, and P. T. Hammond, "Hydrogen-bonded multilayer of pH-responsive polymeric micelles with tannic acid for surface drug delivery", *Chem Comm*, **28**, 4194-4196, (2009).

24. P.T. Jia, A.A. Argun, J.W. Xu, S.X. Xiong, J. Ma, P.T. Hammond and X.H. Lu, "Enhanced Electrochromic Switching in Multilayer Thin Films of Polyaniline-Tethered Silsesquioxane Nanocage", *Chemistry of Materials*, **21**, 4434-4441 (2009).
25. J. Kim, S.W. Lee, P.T. Hammond, Y. Shao-Horn, "Electrostatic Layer-by-Layer Assembled Au Nano particle/MWNT Thin Films: Microstructure, Optical Property, and Electrocatalytic Activity for Methanol Oxidation", *Chemistry of Materials*, **21**, 2993-3001 (2009).
26. D.J. Schmidt, F.Ç. Cebeci, Z.I. Kalcioğlu, S.G. Wyman, C. Ortiz, K.J. Van Vliet, and P.T. Hammond, "Electrochemically-Controlled Swelling and Mechanical Properties of a Polymer Nanocomposite", *ACS Nano*, **3** (8), 2207-2216 (2009).
27. E. Verploegen, M. Kozberg, T. Zhang, J. Soulages, G.H. McKinley, and P.T. Hammond, "Reversible Switching of the Shear Modulus of Photoresponsive Liquid-Crystalline Polymers", *Angewandte Chemie*, **48**, 3494-3498 (2009).
28. A.C. Miller, A. Bershteyn, W. Tan, P.T. Hammond, R.E. Cohen and D.J. Irvine, "Block Copolymer Micelles as Nanocontainers for Controlled Release of Proteins from Biocompatible Oil Phases", *Biomacromolecules*, **10**, 732-741 (2009).
29. R.C. Smith, A. Leung, B.S. Kim, and P.T. Hammond, "Hydrophobic Effects in the Critical Destabilization and Release Dynamics of Degradable Multilayer Films", *Chemistry of Materials*, **21**, 1108-1115 (2009).
30. R.S. Waletzko, L.T.J. Korley, B.D. Pate, E.L. Thomas and P.T. Hammond, "Role of Increased Crystallinity in Deformation-Induced Structure of Segmented Thermoplastic Polyurethane Elastomers with PEO and PEO-PPO-PEO Soft Segments and HDI Hard Segments", *Macromolecules*, **42**, 2041-2053 (2009).
31. C. K. Ober, S. Z. D. Cheng, P. T. Hammond, M. Muthukumar, E. Reichmanis, K. L. Wooley and T. P. Lodge, "Research in Macromolecular Science: Challenges and Opportunities for the Next Decade", *Macromolecules*, **42**, 465-471 (2009).
32. B.S. Kim, H.F. Gao, A.A. Argun, K. Matyjaszewski and P.T. Hammond, "All-Star Polymer Multilayers as pH-Responsive Nanofilms", *Macromolecules*, **42**, 368-375 (2009).
33. S.W. Lee, B.S. Kim, S. Chen, Y. Shao-Horn and P.T. Hammond, "Layer-by-Layer Assembly of All Carbon Nanotube Ultrathin Films for Electrochemical Applications", *JACS*, **131**, 671-679 (2009).
34. J.A. Lee, K.C. Krogman, M. Ma, R. M. Hill, P. T. Hammond and G.C. Rutledge, "Highly Reactive Multilayer Assembled TiO₂ Coating on Electrospun Polymer Nanofibers", *Advanced Materials*, **21**, 1252, (2008).
35. K.T. Nam, R. Wartena, P. J. Yoo, F.W. Liao, Y. J. Lee, Y-M. Chiang, P.T. Hammond, and Angela M. Belcher, "Stamped microbattery electrodes based on self-assembled M13 viruses", *PNAS*, **105**, 17227-17235 (2008).

36. K. C. Krogman, K. F. Lyon, and P. T. Hammond, "Metal Ion Reactive Thin Films Using Spray Electrostatic LbL Assembly", *Journal of Physical Chemistry B.*, **112**, 14453-14460, (2008).
37. H.F. Chuang, R.C. Smith, and P.T. Hammond, "Polyelectrolyte multilayers for tunable release of antibiotics", *Biomacromolecules*, **9**, 1660-1668 (2008).
38. M. Macdonald, N. M. Rodriguez, R. Smith and P.T. Hammond, "Release of a model protein from biodegradable self assembled films for surface delivery applications", *Journal of Controlled Release*, **131**, 228-234 (2008).
39. E. Verploegen E, T. Zhang, Y.S. Jung, C. Ross, and P.T. Hammond, "Controlling the Morphology of Side Chain Liquid Crystalline Block Copolymer Thin Films through Variations in Liquid Crystalline Content", *Nano Lett*, **8**, 3434-3440 (2008).
40. H.I. Lee, J.A. Lee, Z.Y. Poon, and P.T. Hammond, "Temperature-triggered reversible micellar self-assembly of linear-dendritic block copolymers", *Chemical Communications*, **32**, 3726-3728 (2008).
41. P. Podsiadlo, M. Michel, J. Lee, E. Verploegen, N.W.S. Kam, V. Ball, J. Lee, Y. Qi, A.J. Hart, P.T. Hammond, N.A. Kotov, "Exponential growth of LBL films with incorporated inorganic sheets", *Nano Letters*, **8**, 1762-1770 (2008).
42. J.L. Lutkenhaus, K. McEnnis, and P.T. Hammond "Nano- and microporous layer-by-layer assemblies containing linear poly(ethyleneimine) and poly(acrylic acid)", *Macromolecules*, **41**, 6047-6054 (2008).
43. J. Seo, J.L. Lutkenhaus, J. Kim, P.T. Hammond and K. Char, "Effect of the Layer-by-Layer (LbL) Deposition Method on the Surface Morphology and Wetting Behavior of Hydrophobically Modified PEO and PAA LbL Films", *Langmuir*, **24**, 7995-8000 (2008).
44. K.C. Wood, N.S. Zacharia, D. J. Schmidt, S.N. Wrightman, B.J. Andaya, and P.T. Hammond, "Electroactive Controlled Release Thin Films", *PNAS*, **105**: 2280-2285 (2008).
45. A.A. Argun, J. N. Ashcraft, and P. T. Hammond "Highly Conductive, Methanol Resistant Polyelectrolyte Multilayers", *Advanced Materials*, **20**, 1539-1543 (2008).
46. E. Verploegen, T. Zhang, N. Murlo, P.T. Hammond, "Influence of Variations of Liquid Crystalline Content upon the Self-assembly Behavior of Siloxane Based Block Copolymers", *Soft Matter*, **4**, 1279 (2008).
47. P.J. Yoo, N.S. Zacharia, J. Doh, K.T. Nam, A. M. Belcher, and P.T. Hammond, "Controlling Surface Mobility in Interdiffusing Polyelectrolyte Multilayers", *ACS Nano*, **2**, 561-571 (2008).
48. K. C. Wood, S. M. Azarin, W. Arap, R. Pasqualini, R. Langer and P. T. Hammond, "Tumor-Targeted Gene Delivery Using Molecularly Engineered Hybrid Polymers Functionalized with a Tumor-Homing Peptide", *Bioconjugate Chemistry*, **19**, 403-405 (2008).

49. P.J. Yoo, K.T. Nam, A.M. Belcher, P.T. Hammond, "Solvent-Assisted Patterning of Polyelectrolyte Multilayers and Selective Deposition of Virus Assemblies", *Nano Letters*, **8**, 1081-1089 (2008).
50. A.C. Miller, R.D. Bennett, P.T. Hammond, D.J. Irvine, and R.E. Cohen, "Functional Nanocavity Arrays via Amphiphilic Block Copolymer Thin Films", *Macromolecules* **41**, 1739-1744 (2008).
51. K. Krogman, N.S. Zacharia, D.Grillo, and P.T. Hammond, "Photocatalytic Layer-by-Layer Coatings for Degradation of Acutely Toxic Agents", *Chemistry of Materials* **20**, 1924-1930 (2008).
52. B. S. Kim, S.W. Park and P.T. Hammond, "Hydrogen-Bonding Layer-by-Layer-Assembled Biodegradable Polymeric Micelles as Drug Delivery Vehicles from Surfaces", *ACS Nano*, **2**, 386-392 (2008).
53. S.G. Im, B.S. Kim, L.H. Lee, W.E. Tenhaeff, P.T. Hammond, and K.K. Gleason, "A Directly Patternable, Click-Active Polymer Film via Initiated Chemical Vapor Deposition", *Macromol. Rapid Commun.*, **29**, 1648-1654 (2008).
54. S.G. Im, K.W. Bong, B.S. Kim, S.H. Baxamusa, P.T. Hammond, P.S. Doyle, K.K. Gleason, "Patterning Nanodomains with Orthogonal Functionalities: Solventless Synthesis of Self-Sorting Surfaces", *JACS*, **130**, 14424 (2008).
55. Y.H. Kim, J. Park, P.J. Yoo, and P.T. Hammond, "Selective assembly of colloidal particles on a nanostructured template coated with polyelectrolyte multilayers", *Advanced Materials*, **19**, 4426 (2007).
56. N.S. Zacharia, M. Modestino, and P.T. Hammond, "Factors Influencing the Interdiffusion of Weak Polycations in Multilayers", *Macromolecules*, **40**, 9523-9528 (2007).
57. P. M. Nguyen, N. S. Zacharia, E. Verploegen, P.T. Hammond, "Extended Release Antibacterial Layer-by-Layer Films Incorporating Linear-Dendritic Block Copolymer Micelles", *Chemistry of Materials*, **19**, 5524-5530(2007).
58. J.L. Lutkenhaus, K. McEnnis, and P.T. Hammond, "Tuning the Glass Transition of and Ion Transport within Hydrogen-Bonded Layer-by-Layer Assemblies", *Macromolecules*, **40**, 8367-8373 (2007).
59. J.P. Lock, J.L. Lutkenhaus, N.S. Zacharia, S.G. Im, P.T. Hammond PT and K.K. Gleason, "Electrochemical investigation of PEDOT films deposited via CVD for electrochromic applications", **157**, 894-898 (2007).
60. E. Verploegen, D. Boone, and P.T. Hammond, "Morphology of Side Chain Liquid Crystalline Block Copolymer Thin Films and Effects of Thermal Annealing" *Journal of Polymer Science: Part B: Polymer Physics*, Vol. 45, 3263-3266 (2007).
61. K. C. Krogman, N.S. Zacharia, S. Schroeder, and P.T. Hammond, "Automated Process for Improved Uniformity and Versatility of Layer-by-Layer Deposition", *Langmuir*, **23**, 3137-3141 (2007).

62. N.S. Zacharia, D.M. DeLongchamp, M. Modestino, and P.T. Hammond, "Controlling Diffusion and Exchange in Layer-by-Layer Assemblies", *Macromolecules*, **40**, 1598-1603 (2007).
63. J. Seo, J.L. Lutkenhaus, J. Kim, P.T. Hammond and K. Char, Development of surface morphology in multilayered films prepared by layer-by-layer deposition using poly(acrylic acid) and hydrophobically modified poly(ethylene oxide)", *Macromolecules* **40**, 4028-4036 (2007).
64. J.L. Lutkenhaus and P.T. Hammond, "Electrochemically enabled polyelectrolyte multilayer devices: from fuel cells to sensors", *Soft Matter*, **3**, 804-816 (2007).
65. J. Seo, J.L. Lutkenhaus, J. Kim, P.T. Hammond, P. T., K. Char, "Development of Surface Morphology in Multilayered Films Prepared by Layer-by-Layer Deposition Using Poly(acrylic acid) and Hydrophobically Modified Poly(ethylene oxide)", *Macromolecules*, **40**, 4028-4036 (2007).
66. E. Verploegen, L.C. McAfee, L. Tian, D. Verploegen, P. T. Hammond, "Observation of Transverse Cylinder Morphology in Side Chain Liquid Crystalline Block Copolymers", *Macromolecules*, **40**, 777-780 (2007).
67. J. L. Lutkenhaus, E. A. Olivetti, E.A. Verploegen, B.M. Cord, D.R. Sadoway, P.T. Hammond, "Anisotropic Structure and Transport in Self-Assembled Layered Polymer-Clay Nanocomposites", *Langmuir*, **23**, 8515-8521 (2007).
68. S.G. Im, P.J. Yoo, P.T. Hammond, and K.K. Gleason, "Grafted conducting polymer films for nano-patterning onto various organic and inorganic substrates by oxidative chemical vapor deposition", *Advanced Materials*, **19**, 2863 (2007).
69. P. J. Yoo, K.T. Nam, J. Qi, S-Kwan Lee, J. Park, A. M. Belcher, and P. T. Hammond "Spontaneous Assembly of Viruses on Multilayered Polymer Surfaces", *Nature Materials*, **5**, 234-240 (2006).
70. K. T. Nam, D.-W. Kim, P. J. Yoo, C.-Y. Chiang, N. Meethong, P.T. Hammond, Y.-M. Chiang and A. M. Belcher, "Virus Enabled Synthesis and Assembly of Nanowires for Lithium Ion Battery Electrodes", *Science*, **312**, 885-888 (2006).
71. K.C. Wood, H.F. Chuang, R.D. Batten, D.M. Lynn, and P T. Hammond "Controlled Diffusion and Sustained, Multi-Agent Drug Delivery from Layer-by-Layer Thin Films", *PNAS*, **103**, 10207-10212 (2006).
72. P. M. Nguyen and P.T. Hammond, "Amphiphilic linear-dendritic triblock copolymers composed of poly(amidoamine) and poly(propylene oxide) and their micellar-phase and encapsulation properties" *Langmuir* **22** (18): 7825-7832 (2006).
73. L. Tian, P. M. Nguyen, P. T. Hammond, "Vesicular self-assembly of comb-dendritic block copolymers", *Chem. Commun.* **33**, 3489-3491 (2006).
74. L. Tian, P. T. Hammond, "Comb-dendritic block copolymers as tree-shaped macromolecular amphiphiles for nanoparticle self-assembly", *Chemistry of Materials*, **18** (17), 3976-3984 (2006).

75. L.T.J. Korley, S.M. Liff, N. Kumar, G. H. McKinley, and P. T. Hammond, "Preferential association of segment blocks in polyurethane nanocomposites", *Macromolecules* **39**(20), 7030-7036 (2006).
76. R. D. Bennett, A. J. Hart, A. C. Miller, P. T. Hammond, D. J. Irvine, "Creating Patterned Carbon Nanotube Catalysts through the Microcontact Printing of Block Copolymer Micellar Thin Films", *Langmuir*, **22**(20), 8273-8276 (2006).
77. H. Kim, R. E. Cohen, P. T. Hammond, and D.J. Irvine, "Live Lymphocyte Arrays for Biosensing" , *Advanced Functional Materials*, **16**, 1313-1323 (2006).
78. R. Singh, E. Verploegen, P.T. , and R.R. Schrock, "Synthesis of ABA triblock copolymers via ring opening metathesis polymerization using a bimetallic initiator: Influence of a flexible spacer in the side chain liquid crystalline block", *Macromolecules* **39**, 8241-8249 (2006).
79. A.J. Gabert, E. Verploegen, P.T. Hammond, and R. R. Schrock, "Synthesis and Characterization of ABA Triblock Copolymers Containing Smectic C* Liquid Crystal Side Chains via Ring-Opening Metathesis Polymerization Using a Bimetallic Molybdenum Initiator", *Macromolecules*, **39**, 3993-4000 (2006).
80. L.T. James Korley, B. D. Pate, E. L. Thomas and P. T. Hammond, "Effect of the degree of soft and hard segment ordering on the morphology and mechanical behavior of semicrystalline segmented polyurethanes", *Polymer*, **47**, 3073-3082 (2006).
81. T. Farhat and P.T. Hammond, "Fabrication of a 'Soft' Membrane Electrode Assembly Using Layer-By-Layer Technology", *Advanced Functional Materials* **16**, 433-444 (2006).
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