

## Jamie M. Messman

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### Education

St. Norbert College, De Pere, WI	Chemistry	B.S. 1999
University of Southern Mississippi, Hattiesburg, MS.	Polymer Science and Engineering	Ph.D. 2004

### Professional Experience

- 2007-present      Research Staff, Center for Nanophase Materials Sciences, Macromolecular Nanomaterials Group Oak Ridge National Laboratory, Oak Ridge, TN
- 2006-2007      Postdoctoral Research Associate, Center for Nanophase Materials Sciences, Macromolecular Complex Systems Group, Oak Ridge National Laboratory, Oak Ridge, TN, Group Leaders: Jimmy W. Mays, Phillip F. Britt, *Research Emphasis:* Synthesis and characterization of novel bioinspired (co)polymers using living and pseudo-living polymerization techniques.
- 2004-2006      Postdoctoral Research Associate, Chemical Sciences Division Oak Ridge National Laboratory, Oak Ridge, TN, Physical Organic Group-Phillip Britt (mentor); Jimmy Mays (mentor), *Research Emphasis:* Synthesis and characterization of well-defined polymers, including deuterated and partially deuterated materials, for X-ray and neutron scattering studies. Utilized anionic, pseudo-living carbocationic and metallocene catalyzed polymerization technologies.
- 5/2003-9/2003      Early Identification (EID) Intern, Polymer and Specialty Chemical Technologies, Performance Polymers and Monomers Lab, General Electric Global Research Center, Niskayuna, NY, Dave Mobley (manager), Farid Khouri (mentor) *Research Emphasis:* Synthesis and characterization of anhydride-based monomers using phase transfer catalysis for the production of Ultem® materials. Evaluated structure-property relationship of novel Ultem® materials using rheology and broadened Ultem® platform.
- 1999-2004      Storey Research Group, The University of Southern Mississippi, Hattiesburg, MS  
*Research Emphasis:* Synthesis and characterization of novel degradable polyesters, poly(ester-carbonate) block copolymers, and poly(ester-acrylate) block copolymers. Utilized real-time, *in-situ* mid-IR reaction monitoring to evaluate polymerization progress and determine polymerization kinetics.  
*Dissertation title:* Synthesis and Characterization of Functionalized Poly(L-lactide)-based Materials and Lactone Polymerization Kinetics using Real-time ATR-FTIR Spectroscopy, *Research Advisor:* Robson F. Storey
- 1997-1999      St. Norbert College, DePere, WI, Research Assistant to Professor Dave Klopotek  
*Research Emphasis:* Developed materials/monomers used as radar-deflecting coatings in light-weight aircraft (NASA-funded).

### **Professional and Synergistic Activities**

International Advisory Board Member – IUPAC World Polymer Congress Macro2012, Blacksburg, VA, June 2012.

Organizer, Session on “Peptides and Polypeptides: From Synthesis and Characterization to Application” at 239th ACS National Meeting, San Francisco, CA, Spring 2010

Discussion Leader, Polymers Gordon Research Conference, Mount Holyoke College, 2009

Organizer, National Polymer Graduate Research Conference sponsored by the American Chemical Society-POLY/PMSE Divisions, Oak Ridge TN, 2007

Invited Reviewer: *Biomacromolecules*; *Polymer*; *Journal of Polymer Science*, *Langmuir*, *Macromolecules*, *Macromolecular Rapid Communications*, and *Australian Journal of Chemistry*, *Polymer*, *Polymer Chemistry* 2004–present

### **Research Interests**

- Synthesis and characterization of functional monomers and (co)polymers
- Controlled (co)polymer synthesis using anionic, ring-opening, and pseudo-living free radical and cationic polymerization technologies
- Real-time reaction monitoring of monomer synthesis and polymerization using *in-situ* remote probe mid-IR spectroscopy
- Modification of synthetic and natural (co)polymers
- Stimuli-responsive synthetic (co)polymers
- Self-assembly of synthetic (co)polymers
- Biomimetic and biologically active (co)polymers
- Surface and fiber modification

### **Professional Memberships**

- Member of the American Chemical Society
- Member of the Polymer Chemistry (POLY) Division of the American Chemical Society
- Member of the Polymeric Materials Science and Engineering (PMSE) Division of the American Chemical Society
- Member of Pi Mu Epsilon Honorary National Mathematics Society

### **Publications**

Over 20 publications. Full publication (peer-reviewed) list follows CV.

### **Collaborators**

J. Ankner, ORNL

A. Avgeropoulos, University of Ioannina-Greece

C.A. Guymon, University of Iowa

N. Hadjichristidis, University of Athens-Greece

J. Hedrick, IBM Almaden

T. Long, Virginia Tech

Y.-L. Loo, Princeton University

C. McCormick, University of Southern Mississippi

J. Rawlins, University of Southern Mississippi

J. Rimer, University of Houston

B. Sumerlin, Southern Methodist University

R. Toomey, University of South Florida

C. Wade, IBM Almaden

T. Xu, University of California-Berkeley

**Graduate and Postdoctoral Advisors:**

PhD Advisor: R. F. Storey, University of Southern Mississippi

Postdoctoral Advisors: P. F. Britt, Oak Ridge National Laboratory, and J. W. Mays, University of Tennessee-Knoxville

**Thesis Advisor and Postgraduate-Scholar Sponsor:** None

Total Graduate Students Advised: 0

Total Postdoctoral Scholars Advised: 1

## Publication List:

1. Lokitz, B.S.\*; Wei, J.; Hinestrosa, J.P.; Ankner, J.F.; Kilbey II, S.M.; **Messman, J.M.\*** “Manipulating Interfaces through Surface Confinement of Poly(glycidyl methacrylate)-block-poly(vinylidimethylazlactone), a Dually Reactive Block Copolymer” *Macromolecules* **2012**, *45*, 6438-6449.
2. Tomonori Saito, Rebecca H. Brown, Marcus A. Hunt, Deanna L. Pickel, Joseph M. Pickel, **Jamie M. Messman**, Frederick S. Baker, Martin Keller, Amit K. Naskar\* “Turning Renewable Resources into Recyclable Polymer: Development of Lignin-Based Thermoplastic” *Green Chemistry* **2012**, *14*, 3295-3303. (journal cover).
3. Chen, J.; Yu, X.; Hong, K.; **Messman, J.M.**; Pickel, D.L.; Xiao, K.; Dadmun, M.; Mays, J.W.; Rondinone, A.J.; Sumpter, B.G.; Kilbey, S.M. II “Ternary Behavior and Systematic Nanoscale Manipulation of Domain Structures in P3HT/PCBM/P3HT-b-PEO Films,” *J. Mater. Chem.* **2012**, *22*, 13013-13022.
4. Huang, T.; **Messman, J.M.\***; Hong, K.; Mays, J.W. “Novel Amphiphilic Block Copolymers Derived from the Selective Fluorination and Sulfonation of Poly(styrene-block-1,3-cyclohexadiene)” *J. of Polym. Sci., Part A: Polym. Chem.* **2011**, *50*, 338-345.
5. **Messman, J.M.\***; Goswami, M.; Pickel, D.L.; Uhrig, D.W.; Sumpter, B.G.; Mays, J.W. “Combatting Ionic Aggregation using Dielectric Forces – Combining Modeling/Simulation and Experimental Results to Explain End-capping of Primary Amine Functionalized Polystyrene,” *Polymer Chemistry* **2011**, *2*, 2481-2489. (journal cover).
6. Alonzo, J.; Chen, J.; **Messman, J.**; Yu, X.; Hong, K., Deng, S.; Swader, O.; Dadmun, M., Ankner, J.F.; Britt, P.; Mays, J.W.; Malagoli, M.; Sumpter, B.G.; Bredas, J-L, Kilbey, S.M. “Assembly and Characterization of Well-Defined High-Molecular-Weight Poly(*p*-phenylene) Polymer Brushes,” *Chemistry of Materials* **2011**, *23*, 4367-4374.
7. Soto-Cantu, E.; Lokitz, B.S.; Hinestrosa, J.P.; Deodhar, C.; **Messman, J.M.**; Ankner, J.F.; Kilbey II, S.M. “Versatility of Alkyne-Modified Poly(Glycidyl Methacrylate) Layers for Click Reactions,” *Langmuir* **2011**, *27*, 5986–5996.
8. Polizos, G.; Tuncer, E.; Qiu, X.; Aytuğ, T.; Kidder, M.K.; **Messman, J.M.**; Sauers, I. “Nonfunctionalized Polydimethylsiloxane Superhydrophobic Surfaces Based on Hydrophobic-hydrophilic Interactions” *Langmuir*, **2011**, *27*, 2953–2957.
9. Black, M.; **Messman, J.**; Rawlins, J. “Chain Transfer of Vegetable Oil Macromonomers in Acrylic Solution Copolymerization” *Journal of Applied Polymer Science* **2010**, *120*, 1390-1396.
10. Goswami, M.; Sumpter, B.G.; Huang, T.; **Messman, J.M.**; Gido, S.P.; Isaacs-Sodeye, A.I.; Mays, J.W. “Tunable Morphologies from Charged Block Copolymers” *Soft Matter* **2010**, *6*, 6146-6154.
11. Wang, X.; **Messman, J.**; Mays, J.W.; Baskaran, D. “Polypeptide Grafted Hyaluronan: Synthesis and Characterization” *Biomacromolecules* **2010**, *11*, 2313-2320.
12. Lokitz, B.S.; **Messman, J.M.**; Hinestrosa, J.P.; Alonzo, J.; Verduzco, R. Brown, R.; Osa, M.; Ankner, J.; Kilbey II, S.M. “Dilute Solution Properties and Surface Attachment of RAFT Polymerized 2-Vinyl-4,4-Dimethylazlactone (VDMA)” *Macromolecules* **2009**, *42*, 9018-9026.

13. Pickel, D.L.; Politakos, N.; Avgeropoulos, A.; **Messman, J.M.\*** "A Mechanistic Study of  $\alpha$ -Amino Acid-N-Carboxy Anhydride Polymerization: Comparing Initiation and Termination Events in High Vacuum and Traditional Polymerization Techniques" *Macromolecules* **2009**, *42*, 7781-7788.
14. Tuncer, E.; Sauers, I.; James, R.D.; Ellis, A.R.; **Messman, J.M.**; Polyzos, G. ; Aytug, T. "Oven Bag (polyamide 66) as a Cryogenic Dielectric" *Cryogenic* **2009**, *49*, 463-468.
15. **Messman, J.M.\***; Lokitz, B.S.; Pickel, J.M.; Kilbey II, S.M. "Highly Tailorable Materials based on 2-Vinyl-4,4-dimethyl azlactone: (Co)Polymerization, Synthetic Manipulation and Characterization" *Macromolecules* **2009**, *42*, 3933-3941.
16. Barringer, J.E.; **Messman, J.M.**; Banaszek, A.L.; Meyer III, H.M.; Kilbey II, S.M. "Immobilization of Biomolecules on Poly(vinylidimethylazlactone)-Containing Surface Scaffolds" *Langmuir* **2009**, *25*, 262-268.
17. Moravek, S.J.; **Messman, J.M.**; Storey, R.F. "Polymerization Kinetics of *rac*-Lactide Initiated with Alcohol/Stannous Octoate Using *In Situ* Attenuated Total Reflectance-Fourier Transform Infrared Spectroscopy: An Initiator Study" *J. of Polym. Sci., Part A: Polym. Chem.* **2009**, *47*, 797-803.
18. Huang, T.; **Messman, J.M.**; Mays, J.W. "A New Fluorinated Polymer Having Two Connected Rings in the Main Chain: Synthesis and Characterization of Fluorinated Poly(1,3-cyclohexadiene" *Macromolecules* **2008**, *41*, 266-268.
19. Zhang, L.; Nederberg, F.; Pratt, R.; **Messman, J.M.**; Hedrick, J. and Wade, C "Organocatalytic stereoselective polymerization of lactide with super bases" *Journal of the American Chemical Society* **2007**, *129*, 12610-12611.
20. Aliferis, T.; Iatrou, H.; Hadjichristidis, N.; **Messman, J.**; Mays, J. "Synthesis and Characterization of 3- and 4-Arm Star-Block Copolypeptides using Multifunctional Amino Initiators and High Vacuum Techniques" *IUPAC Macromol. Symp.* **2006**, *240*, 12-17.
21. **Messman, J.M.**; Storey, R.F. "Synthesis and Characterization of Multi-Block Copolymers Composed of Poly(5-Methyl-5-benzyloxycarbonyl-1,3-dioxan-2-one) (PMBC) Outerblocks and Poly(L-lactide) (PLLA) Innerblocks" *J. of Polym. Sci., Part A: Polym. Chem.* **2006**, *44*, 6817-6835.
22. **Messman, J.M.\***; Scheuer, A.D.; Storey, R.F. "Synthesis and Characterization of A-B-A Triblock Copolymers Derived from Chloro-telechelic Poly(L-lactide): Combining Ring-Opening Polymerization (ROP) and Atom Transfer Radical Polymerization (ATRP)" *Polymer* **2005**, *46*, 3628-3638.
23. **Messman, J.M.**; Storey, R.F. "Real-Time Monitoring of the Ring-Opening Polymerization of *rac*-Lactide with *In-Situ* ATR-FTIR Spectroscopy with Conduit and Diamond-Composite Sensor Technology" *J. of Polym. Sci., Part A: Polym. Chem.* **2004**, *42*, 6238-6247.

\* indicates corresponding author