

JOHN G. TSAVALAS, Ph.D

Home Address

28 Cumberland St Apt 5
Boston, MA 02115

Work Address

The University of New Hampshire
23 Academic Way, Durham, NH 03824

john.tsavalas@unh.edu, 603-862-2293 (Work)

EDUCATION

Georgia Institute of Technology

Research: Polymer Reaction Engineering

Advisor: Prof. F. Joseph Schork

Ph.D Thesis: A Molecular Level Investigation of Hybrid Miniemulsion Polymerization

MS Thesis: Water-based Crosslinkable Coatings via Miniemulsion Polymerization of Acrylic Monomers in the Presence of Unsaturated Polyester Resin

Minor: Business Management

Ph.D ChE (October, 2001)

MS ChE (September, 1998)

University of Virginia

Research: Biochemical Engineering

BS Thesis: Analysis of Size Exclusion Chromatography of Proteins: Effects of Column Design & Method of Sample Injection on Miscible Viscous Fingering in Porous Media

BS ChE (June, 1996)

EXPERIENCE

The University of New Hampshire, Durham, NH

- *Research Assistant Professor (1/09 – Present)*
Research Scientist III, Materials Science Program (1/07 – 1/09)
Fundamental research in control of latex structured particle morphology, emulsion polymerization kinetics and molecular architecture development, dynamic modeling of latex film formation from multi-component blends and/or structured particles, development of stimuli-responsive coating technologies (self-healing, in-situ corrosion detection, phase changing materials), analytical method development and predictive modeling, project leadership, supervision and mentoring of graduate and undergraduate research assistants. Guest lecturer in graduate level Materials Science classes in polymers. Co-Director of Latex Morphology Industrial Consortium.

The Dow Chemical Company, Midland, MI

- *Research Specialist, Dow Latex, Emulsion Polymers R&D (8/03 – 10/06)*
Sr. Research Engineer, Industrial Biotechnology and Core R&D (11/01 – 7/03)
Fundamental research in control of latex structured particle morphology, control of colloidal agglomeration, film formation, polymers from renewable monomers, polymers for microelectronics industry, product development of several latex product lines, manufacturing plant support including leading teams towards quick crisis solutions, capability development of new analytical tools and methods, and project leadership.

Eindhoven Technical University, Eindhoven, The Netherlands

- *Visiting Scientist, Laboratory of Polymer Chemistry (9/99 – 12/99, 6/00 – 8/00)*
Performed experimental research & kinetic modeling pioneering reversible addition-fragmentation chain transfer (RAFT) living polymerization via a miniemulsion.

School of Chemical Engineering, Georgia Institute of Technology, Atlanta, GA

- *Teaching Assistant, Research Assistant (1996-2001)*

Dept. of Chemical Engineering, University of Virginia, Charlottesville, VA

- *Undergraduate Research Assistant aiding a Doctoral Student (1994-1996)*
Improved design of a chromatography column for protein separation and performed on-line real-time 3D visualization utilizing a nuclear magnetic resonance imager (MRI).

DuPont-Merck Pharmaceutical Company, Chambers Works Site, Deepwater, NJ

- *Research Assistant Intern (Summer 1995)*
Performed experimental research for early-step pharmaceuticals (e.g. AIDS inhibitor, blood thinner). Modeled kinetics of pharmaceutical reactions.

PATENTS

Tsavalas, J.G.; Nguyen, J.K.; Sundberg, D.C. “Microencapsulation of Amines”, July **2009**, Utility Patent Application – Patent Pending; Attorney Docket No. 09815/86711

Tsavalas, J.G.; Nguyen, J.K.; Sundberg, D.C. “Microencapsulation of Amines”, July **2008**, Provisional Patent Application; Serial# 61/135,635

Tsavalas, J.G.; Carrier, R.H.; Sundberg, D.C. “UNHLATEX[®] ParPac”, Sept. **2008**, UNH Invention Disclosure

Tsavalas, J.G.; Carrier, R.H.; Sundberg, D.C. “UNHLATEX[®] Deform”, Sept. **2008**, UNH Invention Disclosure

Tsavalas, J.G.; Kelly, J.; Chaput, A.B.; Roper, J.; Dunnill, H.; Dellinger, T.; Galloway, J.; Pollock, M.; Welsch, G. “Paper Coating Compositions, Coated Papers, and Methods”, **2008**, PCT/US2008005038

Tsavalas, J.G.; Gaupp, C.L.; Roper, J.A.; Galloway, J.G. “Paper Manufacturing Using Agglomerated Hollow Particle Latex”, **2006**, WO2006026283A1 and **2007**, EP1784537A1, and **2008** US20080041544

Wiltz, E.P.; Lysenko, Z.; Aguirre, F.; Sanders, A.; Tsavalas, J.G.; Babb, D.A.; Schrock, A.K., “Polyurethane Foams Made From Hydroxymethyl-Containing Polyester Polyols”, **2006**, EP1627003A1, EP1627003B1

Lysenko, Z.; Schrock, A.K.; Babb, D.A.; Sanders, A.; Tsavalas, J.G.; Jouett, R.; Chambers, L.; Keillor, C.; Gilchrist, J.H., “Polyester-Polyurethane Foam Manufacture”, **2004**, WO2004096883A1

Lysenko, Z.; Schrock, A.K.; Babb, D.A.; Sanders, A.; Tsavalas, J.G.; Jouett, R.; Chambers, L.; Keillor, C.; Gilchrist, J.H., “Vegetable Oil Based Polyols and Polyurethanes Made Therefrom”, **2004**, EP1620483A1, WO2004096882A1

Tsavalas, J.G.; Gooch, J.; Schork, F.J., “Water-Borne Polyester Coatings by Miniemulsion Polymerization.”, **2002**, US6380281B1

PEER REVIEWED PUBLICATIONS

Tsavalas, J. G., Sundberg, D. C., “Hydroplasticization of Polymers – Model Predictions and Application to Emulsion Polymers”, Submitted to *Langmuir*, (Nov. **2009**).

Stubbs, J.; Tsavalas, J. G.; Sundberg, D. C., “The Structural Evolution of Composite Latex Particles during Starve-Fed Emulsion Polymerization: Modeling and Experiments for Kinetically Frozen Morphologies”, submitted to *Macromolecular Reaction Engineering*, (Nov. **2009**).

Augustyniak, A., Tsavalas, J.G., Ming, W., “In-situ Early-Detection of Steel Corrosion via “Turn-On” Fluorescence in Smart Epoxy Coatings”, *Applied Materials & Interfaces*, (**2009**), in press (ASAP Article published online, Oct 12, 2009, DOI: 10.1021/am900527s). This work was also highlighted on Chemical & Engineering News (American Chemical Society weekly magazine, Oct. 26, 2009).

Hudda, L., Tsavalas, J.G., Schork, F.J., “Simulation Studies on the Origin of the Limiting Conversion Phenomenon in Hybrid Miniemulsion Polymerization”, *Polymer*, (**2005**), 46 (4), 993-1001.

Tsavalas, J.G., Schork, F.J., Landfester, K., “Particle Morphology Development in Hybrid Miniemulsion Polymerization”, *JCT Research* (**2004**), 1 (1), 53-63.

Tsavalas, J.G., Schork, F.J., “The Morphology of Alkyd/Acrylate Latexes Produced via Hybrid Miniemulsion Polymerization: Grafting Mechanisms”, *Prog. in Coll. & Polym. Sci.* (**2004**), 124, 126-130.

Tsavalas, J.G., Luo, Y., Hudda, L., Schork, F. J., “Limiting Conversion Phenomenon in Hybrid Miniemulsion Polymerization”, *Polym. React. Eng.* (**2003**), 11 (3), 277-304.

Tsavalas, J.G., Luo, Y., Schork, F.J., "Grafting Mechanisms in Hybrid Miniemulsion Polymerization", *J. Appl. Polym. Sci.* (2003), 87 (11), 1825-1836.

Luo, Y., Tsavalas, J.G., Schork, F.J., "Theoretical Aspects of Particle Swelling in Living Free Radical Miniemulsion Polymerization", *Macromolecules* (2001), 34 (16), 5501-5507.

Tsavalas, J.G., Schork, F. J., de Brouwer, H., Monteiro, M.J., "Living Radical Polymerization by Reversible Addition-Fragmentation Chain Transfer in Ionically Stabilized Miniemulsions", *Macromolecules* (2001), 34 (12), 3938-3946.

de Brouwer, H., Tsavalas, J.G., Schork, F.J., Monteiro, M.J., "Living Radical Polymerization in Miniemulsion by Reversible Addition-Fragmentation Chain Transfer (RAFT)," *Macromolecules* (2000), 33, 9239-9246.

Tsavalas, J.G., Gooch, J., Schork, F.J., "Water-Based Crosslinkable Coatings via Miniemulsion Polymerization of Acrylic Monomers in the Presence of Unsaturated Polyester Resin," *J. Appl. Polym. Sci* (2000), 75 (7), 916-927.

Fernandez, Erik J., Norton, T. Tucker, Jung, William C., Tsavalas, John G., "A Column Design for Reducing Viscous Fingering in Size Exclusion Chromatography", *Biotech. Progress* (1996), 12 (4), 480-487.

PRESENTATIONS

Invited Talk: "Dynamic Modeling of Latex Film Formation", International Polymer Colloids Group (IPCG) - Polymer Colloids Conference, July 6-11, Il Ciocco, Barga, Italy, 2009.

Invited Talk: "Dynamic Modeling of Latex Film Formation", Federation of Societies for Coatings Technology (FSCT) Coatings Tech Conference, Indianapolis, IL, Apr 28-29, 2009.

Invited Lecturer: "ABCs of Waterborne Coatings", Federation of Societies for Coatings Technology (FSCT) Coatings Tech, Technology Short Course, Indianapolis, IL, Apr 27, 2009.

"Nanostructure in alkyd/acrylate materials produced via hybrid miniemulsion polymerization", Spring National ACS Meeting, Division of Polymer Chemistry, Salt Lake City, UT, Mar 25, 2009, talk presented by F.J. Schork.

"Model Prediction of the Glass Transition Temperature of Latex Co-Polymers in the Water-Plasticized State", UK Polymer Colloids Forum, University of Greenwich, England, Aug 28-29, 2008.

Invited Talk: "Dynamic Modeling of Latex Film Formation", BASF Polymer Colloids & Nanostructured Materials Conference, ISIS, Strasbourg, France, Aug 26-27, 2008.

"Stimuli-Responsive Self-Healing Coatings Utilizing a Two-Part Microcapsule Approach", 48th Microsymposium, Polymer Colloids: Design to Biomedical & Industrial Applications, Prague, Czech Republic, July 20-24, 2008.

Poster: "Development of a Predictive Model for Hydroplasticized Latex Co-Polymer T_g", Gordon Research Conference: Polymer Colloids: Particles for the Future, Tilton, NH, June 24-29, 2007.

Teaching: Annual Workshop, Multiple Lectures, "Core-Shell Latex Particles: Fundamental Aspects of Morphology Control", University of New Hampshire, June 2-5, 2007 & 2008.

Invited Talk: "Waterborne Hybrid Alkyd/Acrylic Polymer Latex: Advantages & Challenges", Sink or Swim: Waterborne & Innovative Coatings Program, Cleveland Coatings Society, Akron, OH, May 23rd, 2007.

Invited Talk: "Waterborne Hybrid Alkyd/Acrylic Polymer Latex: Advantages & Potential Application Challenges", UNH Materials Science Seminar Series, Feb 1st, 2007.

"Controlled Radical Polymerization by Reversible Addition-Fragmentation Chain Transfer (RAFT) via a Miniemulsion," Georgia Tech Chemical Engineering Symposium 2000, Atlanta, GA, May 11 – May 12, 2000.

John G. Tsavalas, Ph.D (Continued)

“Controlled Radical Polymerization by Reversible Addition-Fragmentation Chain Transfer via a Miniemulsion,” 24th Foundations of Emulsion Polymerization (SEP) meeting, Eindhoven, The Netherlands, December **1999**.

“Water-Based Polyester/Acrylic Coatings via Hybrid Miniemulsion Polymerization,” 3rd Annual Green Chemistry & Engineering Conference, Washington, DC, June 29 - July 1, **1999**.

“Acrylic-Polyester Graft Copolymers Via Hybrid Miniemulsion Polymerization,” International Symposium on Polymers in Dispersed Media, Lyon, France, April 11-15, **1999**.

“Graft Copolymers for Water-Borne Coatings Applications via Hybrid Miniemulsion Polymerization,” 6th International Workshop on Polymer Reaction Engineering, Berlin, Germany, October 5-7, **1998**.

PROFESSIONAL SERVICE

- Reviewer for: *Polymer, Journal of Applied Polymer Science, Colloid and Polymer Science, & Industrial & Engineering Chemistry Research*

PROFESSIONAL ASSOCIATIONS

- Federation of Societies for Coatings Technology (FSCT), 2008 – Present
- American Institute of Chemical Engineers (AIChE), 1994 - Present
- American Chemical Society (ACS), 1996 - Present

SPECIAL SKILLS

- Programming Languages (C++, Matlab, Mathematica, HTML)

REFERENCES *Available on request*