Exponent®
Engineering & Scientific Consulting

Yalin Liu, Ph.D.

Senior Associate | Polymers & Chemistry
Menlo Park
+1-650-688-6758 | yliu1@exponent.com

Professional Profile

Dr. Liu's is a skilled chemical engineer with research interests and expertise in formulation development, structure-property relationships, and end-use performance of adhesive material systems. She has extensive experience in the development, formulation, scale-up, quality testing, and large-scale industrial manufacturing of polymer/adhesive products. Her professional interests include material characterization, formulation analysis and failure analysis of polymeric materials.

Dr. Liu was trained as a chemical engineer with deep expertise in the characterization of polymers. She has extensive experience in techniques such as dynamic mechanical analysis (DMA), differential scanning calorimetry (DSC), thermogravimetric analysis (TGA), rheology, Fourier transform infrared spectroscopy (FTIR), gel permeation chromatography (GPC), nuclear magnetic resonance (NMR), ASTM mechanical testing (including adhesion, peel strength, and compression), as well as SEM and optical microscopy.

Prior to joining Exponent, Dr. Liu worked in the adhesives industry as a Senior Chemist. In this role, she developed and applied acrylic, epoxy, and polyurethane formulations for aerospace, medical, and general industrial applications. She also has extensive experience in optimizing processing parameters, scaling up production, and troubleshooting manufacturing challenges.

Dr. Liu earned her Ph.D. in Chemical Engineering from the University of Massachusetts Amherst. Her doctoral research focused on designing material properties in polyelectrolyte complexes. She systematically quantified their phase behavior and linear viscoelasticity to better understand the interplay between polymer chain length, backbone chemistry, polymer concentration, and salt concentration.

Academic Credentials & Professional Honors

Ph.D., Chemical Engineering, University of Massachusetts, Amherst, 2020

B.S., Chemical Engineering, University of Minnesota, Twin Cities, 2014

Prior Experience

Sr. Chemist, Henkel, 2020-2025

Professional Affiliations

American Chemical Society (ACS)

American Institute of Chemical Engineers (AIChE)

Publications

Y. Liu, B. Momami, H.H. Winter, S.L. Perry, Rheological Characterization of Liquid-to-solid transitions in Bulk Polyelectrolyte Complexes, Soft Matter, 2017, 13(40), 7332-7340.

Y. Liu, H.H. Winter, S.L. Perry, Linear Viscoelasticity of Complex Coacervates, Advances in Colloid Interface Sci. 2017, 239, 46–60.

Y. Liu, C.F. Chalarca, R.N. Carmean, R.A. Olson, B.S. Sumerlin, T. Emrick, S.L. Perry, Effect of Polymer Chemistry on the Linear Viscoelasticity of Complexes Coacervates, Macromolecules. 2020, 53(18), 7851-7864

M. Radhakrishna, K. Basu, Y. Liu, R. Shamsi, S. L. Perry, C. E. Sing, Molecular Connectivity and Correlation Effects on Polymer Coacervation, Macromolecules, 2017, 50, 3030–3037.

M. Skinner, B. Johnston, Y. Liu, R. Selhorst, I, Xenidou, Perry, S. L, Emrick, T, Synthesis of Zwitterionic Pluronic Analogs, Biomacromolecules, 2018, 19(8), 3377-3389.

X. Meng, Y. Du, Y. Liu, E.B. Coughlin, S.L. Perry, J.D. Schiffman, Electrospinning Fibers from Oligomeric Complex Coacervates: No Chain Entanglements Needed, Macromolecules, 2021, 54 (11), 5033-5042I.

Presentations

Y. Liu, C.F. Santa Chalarca, R.N. Carmean, R.A. Olson, B.S. Sumerlin, T. Emrick, S.L. Perry, Polymer Chemistry and Effect on the Linear Viscoelasticity on Polyelectrolyte Complexes, Oral Presentation, APS March Meeting, Boston, MA, March 2019.

Y. Liu, W.C. Blocher, X. Meng, M. Labbe, E. Voke, C. Boucher, H.H. Winter, M. Corradini, J.D. Schiffman, S.L. Perry, Dynamics in Polyelectrolyte Complex Materials, Oral Presentation, APS March Meeting, Los Angeles, March, 2018.

Y. Liu, S.L. Perry, Designing Material Dynamics in Polyelectrolyte Complexes, Oral Presentation, University of Massachusetts Amherst Department of Chemical Engineering G.R.A.S.S. Seminar, Amherst, MA, December 2017

Y. Liu, B. Momani, M. Labbe, H.H. Winter, S.L. Perry, Designing Material Dynamics in Polyelectrolyte Complexes, Oral Presentation, AIChE Annual Meeting, Minneapolis, MN, October 2017

Y. Liu, B. Momani, H.H. Winter, S.L. Perry, Liquid-to-Solid Transitions in Polyelectrolyte Complexes, Poster Presentation, Colloidal, Macromolecular & Polyelectrolyte Solutions Gordon Research Conference, Ventura, February 2016

Y. Liu, H.H. Winter, S.L. Perry, Liquid-to-Solid Transitions in Polyelectrolyte Complexes, Poster Presentation, ACS National Meeting, Boston, August 2015.

Additional Education & Training

Wyatt Light Scattering University (Santa Barbara, CA) July 2015

An intensive training course focused on the theory, design, and use of light scattering experiments for materials characterization.

Peer Reviews

Small

Macromolecules

Nano Select

Rheologica Acta

ACS Applied Polymer Materials

ACS Food Science & Technology