

Shujun (Sue) Chen, Ph.D.
Scientist**Professional Profile**

Dr. Shujun (Sue) Chen is a Scientist in Exponent's Polymer Science and Materials Chemistry practice. Dr. Chen uses her expertise in polymer science and engineering to provide clients across multiple industries with pre- and post-market polymer structure-property investigations and product failure analysis. She has particular experience with product development support and field failure investigations involving plastic pipes, thermoplastic and engineering plastic components, elastomeric seals/over-molds, pressure-sensitive adhesives, polymer barrier films/coatings, and drug-delivery devices.

Dr. Chen specializes in polymer structure-property relationships, with a special interest in polymer morphology and nanostructures. Her past research experience includes morphological design and characterization of block copolymers (in solid state and solution), semi-crystalline polymers, and polymer single crystals, with applications in thermoplastic elastomers, targeted drug-delivery, porous biomedical membranes, and thermochromic optical devices.

Dr. Chen has extensive experience and knowledge in a broad range of polymer characterization techniques, including thermal analysis [differential scanning calorimetry (DSC), thermogravimetric analysis (TGA)], rheology [rheometry, dynamic mechanical analysis (DMA)], morphology and structure characterization [microscopy (optical, atomic force, scanning and transmission electron), diffraction (X-ray and electron), scattering (small-angle light and X-ray)], molecular characterization [FTIR, NMR, GPC, matrix-assisted laser desorption/ionization-time of flight mass spectrometry (MALDI-TOF)], and colloidal characterization [cryo-transmission electron microscopy, confocal microscopy, dynamic light scattering (DLS)].

Prior to joining Exponent, Dr. Chen was a Postdoctoral Research Associate in the Department of Chemical Engineering at Massachusetts Institute of Technology, where she synthesized and investigated the solution self-assembly of a new class of amphiphilic block copolymers and their co-assembly with lipids as functional nanoparticles for targeted drug delivery.

Academic Credentials and Professional Honors

Ph.D., Polymer Science and Engineering, University of Massachusetts Amherst, 2007
M.S., Information Technology, Bentley University (with *high distinction*), 2003
M.S., Polymer Science and Engineering, University of Massachusetts Amherst, 1999
B.S., Chemistry, Wuhan University, China, 1997

Sigma Xi, The Scientific Research Society, 2008
Beta Gamma Sigma, The International Business Honor Society, 2003

Languages

Mandarin Chinese – Native Speaker

Publications

Poon Z, Chen S, Engler AC, Lee H, Atas E, von Maltzahn G, Bhatia SN, Hammond PT. Ligand-clustered ‘patchy’ nanoparticles for modulated cellular uptake and in vivo tumor targeting. *Angewandte Chemie International Edition* 2010; 49:7266–7270.

Wang X, Sandman DJ, Chen S, Gido SP. Thermochromic polydiacetylene micro- and nanocrystals: An unusual size effect in electronic spectra. *Macromolecules* 2008; 41:773–778.

Chen S, Nandi S, Winter HH, Gido SP. Oriented lamellar structure and pore formation mechanism in CSX-processed porous high-density polyethylene. *Macromolecules* 2006; 39:2849–2855.

Chen S, Gido SP, Tsoukatos T, Avgeropoulos A, Hadjichristidis N, Hong K, Mays J.W. Defects in a noncentrosymmetric lamellar block copolymer blend. *Polymer Preprints* 2005; 46(2):542.

Zhou Y, Faust R, Chen S, Gido SP. Synthesis, characterization, and morphology of poly(tert-butyl vinyl ether-b-isobutylene-b-tert-butyl vinyl ether) triblock copolymers. *Macromolecules* 2004; 37:6716–6725.

Presentations and Published Abstracts

Chen S, Hammond PT. Co-assembly of biodegradable comb-dendritic block copolymers and lipids for functional liposomes. 2009 Annual Meeting of the American Institute of Chemical Engineers, Nashville, TN, November 12, 2009.

Chen S, Hammond PT. Self-assembly of comb-rod dendritic block copolymers as tunable drug delivery systems. 2008 Materials Research Society Fall Meeting, Boston, MA, December 1, 2008.

Chen S, Hannond PT. Self-assembly of comb-rod dendritic block copolymers. 2008 Annual Meeting of the American Institute of Chemical Engineers, Philadelphia, PA, November 21, 2008.

Chen S, Hannond PT. Self-assembly of comb-rod dendritic block copolymers. Fall 2008 National Meeting of the American Chemical Society, Philadelphia, PA, August 18, 2008.

Chen S, Gido SP, Tsoukatos T, Avgeropoulos A Hadjichristidis N, Hong K, Mays JW. Defects in noncentrosymmetric lamellar block copolymer blends. 2006 National Meeting of the American Physical Society, Baltimore, MD, March 14, 2006.

Chen S, Nandi S, Winter HH, Gido SP. Oriented lamellar structure and pore formation mechanism in CSX-processed porous high density polyethylene. 2006 National Meeting of the American Physical Society, Baltimore, MD, March 13, 2006.

Chen S, Gido SP, Tsoukatos T, Avgeropoulos A, Hadjichristidis N, Hong K, Mays JW. Defects in noncentrosymmetric lamellar block copolymer blends. Pacifichem 2005, Honolulu, HI, December 17, 2005.

Chen S, Gido SP, Tsoukatos T, Avgeropoulos A, Hadjichristidis N, Hong K, Mays JW. Defects in a noncentrosymmetric lamellar block copolymer blend. Fall 2005 National Meeting of the American Chemical Society, Washington, DC, August 29, 2005.

Chen S, Gido SP. Morphologies of an ABA type triblock terpolymer and its sulfonated ionomer cast from selective solvents. 6th National Graduate Research Polymer Conference, Amherst, MA, June 15, 2005.

Chen S, Nandi S, Winter HH, Gido SP. Long-range periodic structure in porous high density polyethylene crystallized from the gel state. 2005 National Meeting of the American Physical Society, Los Angeles, CA, March 25, 2005.

Chen S, Gido SP. Morphological transitions in a triblock copolymer and its sulfonated ionomer: thermal annealing and solvent effects. 2005 National Meeting of the American Physical Society, Los Angeles, CA, March 21, 2005.

Chen S, Gido SP; Tsoukatos T, Avgeropoulos A Hadjichristidis N, Hong K, Mays JW. Defect study on noncentrosymmetric lamellar block copolymer blends. 2004 National Meeting of the American Physical Society, Montreal, Canada, March 25, 2004.

Chen S, Gido SP, Valluzzi R, Kaplan DL. Crystal structure of a model spider silk peptide. 2001 National Meeting of the American Physical Society, Seattle, WA, March 12, 2001.

Prior Experience

Postdoctoral Research Associate, Massachusetts Institute of Technology, 2006–2009
Graduate Research Assistant, University of Massachusetts Amherst, 2003–2006, 1997–2001
Intern, Linden Technologies, Inc., 2002
Graduate Assistant, Bentley University, 2001–2002

Peer Reviewer

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Professional Affiliations

- American Chemical Society—ACS
- American Institute of Chemical Engineers—AIChE
- American Physical Society—APS
- Materials Research Society—MRS