

Exponent®
Engineering & Scientific Consulting

Stephanie Liffland, Ph.D.

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Professional Profile

Dr. Liffland specializes in the synthesis, characterization, and mechanical behavior of polymeric materials, including adhesives, elastomers, and rigid plastics, with an emphasis on material structure-property relationships. She leverages her broad knowledge of the chemical and physical behavior of polymers to support clients throughout the product development process, from conceptualization and material selection to failure analysis and root cause investigations. Dr. Liffland routinely applies her materials science skills across an array of industries that utilize synthetic materials, including consumer products, medical devices, batteries, consumer electronics, and construction.

Trained as a chemist, Dr. Liffland has extensive experience in small molecule organic synthesis as well as a variety of controlled polymerization methods and characterization techniques including, NMR, UV-Vis, FTIR, GC-MS, and both small- and wide-angle X-ray scattering. She also has broad experience with polymer characterization techniques to probe thermal and mechanical performance such as such as differential scanning calorimetry (DSC), thermogravimetric analysis (TGA), tensile testing, dynamic mechanical analysis (DMA), and oscillatory rheology.

Prior to joining Exponent, Dr. Liffland obtained her Ph.D. from the University of Minnesota, Twin Cities, where she led interdisciplinary work on the development of high-performance sustainable materials as a member of the Center for Sustainable Polymers (CSP). Her research at UMN centered on the design, synthesis, and characterization of aliphatic polyester-based thermoplastic elastomers with a focus on the impact of polymer architecture on material performance.

Academic Credentials & Professional Honors

Ph.D., Chemistry, University of Minnesota, Twin Cities, 2022

M.S., Chemistry, University of Minnesota, Twin Cities, 2019

B.S., Chemistry, University of North Carolina, Chapel Hill, 2017

College of Science and Engineering Graduate Fellowship, University of Minnesota, Twin Cities, 2017-2020

Francis P. Venable Medal, University of North Carolina at Chapel Hill, Chapel Hill, 2017

Professional Affiliations

American Chemical Society (ACS) (2014- Present)

Society of Plastics Engineers (SPE) (2023-Present)

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Publications

Liffland, S.; Hillmyer, M. A. Enhanced Mechanical Properties of Aliphatic Thermoplastic Elastomers through Star Block Architectures. Macromolecules 2021, 54, 20, 9327-9340.

Haque, F. M.; Ishibashi, J. S. A.; Lidston, C. A. L.; Shao, H.; Bates, F.; Chang, A. B.; Coates, G. W.; Cramer, C. J.; Dauenhauer, P. J.; Dichtel, W. R.; Ellison C. J.; Gormong, E. A.; Hamachi, L. S.; Hoye, T. R.; Jin, M.; Kalow, J. A.; Kim, H. J.; Kumar, G.; LaSalle, C. .; Liffland, S.; Lipinski, B. M.; McCambridge, J.; Pang, Y.; Parveen, R.; Peng, X. Popowski, Y.; Prebihalo, E.; Reddi, Y.; Reineke, T.; Seifert, L.; Sheppard, D.; Swartz, J.; Tolman, B. W.; Vlaisavljevich, B.; Wissinger, J.; Xu, S.; Hillmyer, M. A. Defining the macromolecules of tomorrow through synergistic sustainable polymer research. Chem. Rev. 2022, 122, 6, 6322-6373.

Dong, H.; Liffland, S.; Hillmyer, M. A.; Yang, C. Y. M. Engineering in Vivo Production of α-Branched Polyesters. J. Am. Chem. Soc. 2019, 141, 42, 16877-16883.

Presentations

Liffland, S.; Hillmyer, M. A. Enhanced Mechanical Properties of Aliphatic Polyester Thermoplastic Elastomers through Star Block Architectures. Industrial Partnership for Research in Interfacial and Materials Engineering Annual Meeting (Microstructured Polymers), August 2021.

Liffland, S.; Hillmyer, M. A. Enhanced Mechanical Properties of Aliphatic Polyester Thermoplastic Elastomers through Star Block Architectures. ACS – Great Lakes Regional Meeting, June 2021.

Liffland, S.; Hillmyer, M. A. Improving the Mechanical Properties of Aliphatic Polyester Thermoplastic Elastomers through Star Architectures. American Chemical Society Spring 2021 National Meeting, April 2021.