Exponent®
Engineering & Scientific Consulting

Sterling Sweningson, Ph.D.

Scientist | Polymer Science and Materials Chemistry
Natick
+1-508-652-8588 | ssweningson@exponent.com

Professional Profile

Dr. Sweningson is an organic chemist specializing in polymer science, liquid crystals, and molecule synthesis. He has a strong background in multistep chemical synthesis, purification, and characterization of diverse small molecules and polymers. Dr. Sweningson has experience using his strong knowledge of structure-property relationships to prepare additive packages to enhance the performance of bulk network polymers, such as adhesives and rubber materials for use in construction materials and building components, and to formulate liquid crystalline materials for use in displays and other mesogen-based applications.

Dr. Sweningson leverages soft material characterization techniques as well as analytical chemistry tools, including polarized optical microscopy (POM), thermal analysis (e.g., TGA and DSC), gel permeation chromatography (GPC), spectroscopy (NMR, UV-Vis, and GC/LC-MS), X-ray diffraction (XRD), and rheometry. He is an expert in fine chemical purification techniques such as distillation and sublimation.

Prior to joining Exponent, Dr. Sweningson completed his Ph.D. thesis in polymer chemistry at the School of Chemistry and Biochemistry at the Georgia Institute of Technology. His research focused on the synthesis and modification of dynamic polymers and liquid crystals into both structural and optical applications for use in construction materials and liquid crystal displays. While at the Georgia Institute of Technology, Dr. Sweningson managed the EH&S compliance of hazardous chemical storage.

Academic Credentials & Professional Honors

Ph.D., Chemistry, Georgia Institute of Technology, 2023

B.S., Systems and Structural Biology, George Fox University, 2018

Hightower Award for Excellence in Polymer Leadership, 2022

AFOSR Research Award, 2020

Richter Research Scholarship, 2017

Professional Affiliations

American Chemical Society (ACS)

Publications

Presentations

Variable-Temperature NMR Studies of Derivatized Bullvalenes. Invited Oral Presentation, Magnetic Resonance Workshop, Atlanta, GA, 2022.

Asymmetric Bullvalene Functionalization. Oral Presentation, ACS National Meeting and Exposition. Chicago, IL, 2022.

Degradable Materials using Dynamic Carbon-Sulfur Bonds. Poster Presentation, AFOSR Annual Conference. Dayton, OH, 2022.

Materials Chemistry of Bullvalene. Oral Presentation, School of Chemistry and Biochemistry 6th Annual Departmental Graduate Research Retreat. Atlanta, GA, 2021.

Synthesis and Characterization of Bullvalene Polymers. Poster Presentation, Student Polymer Network Graduate Research Symposium. Atlanta, GA, 2021.

Synthesis and Characterization of Bullvalene Materials. Poster Presentation, School of Chemistry and Biochemistry 6th Annual Departmental Graduate Research Retreat. Atlanta, GA, 2020.

Materials Chemistry of Bullvalene. Poster Presentation, School of Chemistry and Biochemistry 5th Annual Departmental Graduate Research Retreat. Whitesburg, GA, 2019.

Synthesis, self-assembly, and temperature-responsiveness of novel functional poly(valerolactone)s. Oral Presentation, George Fox University Senior Symposium. Newberg, OR, 2018.

Synthesis, self-assembly, and temperature-responsiveness of novel functional poly(valerolactone)s. Poster Presentation, 255th ACS National Meeting and Exposition New Orleans. LA, 2018.