Exponent®
Engineering & Scientific Consulting

Danielle Harrier, Ph.D.

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Professional Profile

Trained as a chemical engineer with a specialization in polymer science, Dr. Harrier's research and experience lies at the intersection of material science and failure analysis.

Dr. Harrier leverages her diverse knowledge of biodegradable polymers, emulsion polymerization, and materials characterization techniques to consult on complex projects ranging from leachable and contamination evaluations of finished goods to additive analysis in polymeric materials. She routinely assists clients in material-related root cause investigations in the medical device and consumer products industries.

Dr. Harrier utilizes a variety of chemical analysis methods in these investigations, including gel-permeation chromatography (GPC), nuclear magnetic resonance spectroscopy (NMR), Fourier-transform Infrared spectroscopy (FTIR), gas chromatography-mass spectrometry (GC-MS), thermal desorption gas chromatography-mass spectrometry (TD GC-MS), as well as various microscopy techniques and elemental analysis methods.

Prior to joining exponent, Dr. Harrier's research at the University of Illinois Urbana-Champaign focused on utilizing advanced encapsulation techniques to expand biodegradable polymerization capabilities. Through her research and project work, she has a deep understanding of microfluidic design, fluid mechanics, and polymer formulation development.

Academic Credentials & Professional Honors

Ph.D., Chemical Engineering, University of Illinois, Urbana-Champaign, 2022

M.S., Chemical Engineering, University of Illinois, Urbana-Champaign, 2019

B.S., Chemical Engineering, University of New Mexico, 2017

Prior Experience

NSF Graduate Research Fellow, Department of Chemical and Biomolecular Engineering, University of Illinois Urbana Champaign (UIUC), May 2017- May 2022.

Visiting Research Scholar, Wyss Institute at Harvard University, Jan. 2020-Sept. 2020.

Research Assistant, Center for Integrated Nanotechnology (CINT), Aug. 2016- Aug. 2017.

Research Assistant, Los Alamos National Laboratory (LANL), (May 2013- Aug. 2016).

Professional Affiliations

American Chemical Society (2018-Present)

American Institute of Chemical Engineers (2014-Present)

Society of Women Engineers (SWE) (2013-Present)

Society for Advancement of Chicanos & Native Americans in Science (2015-Present)

Patents

Guironnet, G., Kenis, P., Harrier, Danielle. “Ring Opening Polymerization in Aqueous Dispersion for the Formation of Latex” U.S. patent application number 20210054139 16/997296, 2021.

Sesay, A., Gnyawali, V., Harrier, Danielle, Yan, L., Minghao, E. Weitz, D., Ingber, D. “Systems and Methods for Sugar Reduction for Food and Other Applications.” U.S. Provisional Application No. 63/208,473. June 8, 2021.

Publications

Harrier, Danielle and Guironnet, D. “Design rules for performing water-sensitive ring-opening polymerizations in an aqueous dispersion”. Polym. Chem., 2022,13, 2459-2468.

Harrier, Danielle, Kenis, P., Guironnet, D. “Ring-Opening Polymerization of Cyclic Esters in an Aqueous Dispersion”. Macromolecules 2020, 53, 18, 7767–7773.

Harrier, Danielle, Andersen, Kyle. “Analysis of xRAGE and FLAG High Explosive Burn Models with PBX 9404 Cylinder Tests.” Los Alamos National Laboratory. LA-UR-16-26076. Aug. 4, 2016. Report.

Harrier, Danielle. “Modeling ‘Hot-Spot’ Contributions in Shocked High Explosives at the Mesoscale” Los Alamos National Laboratory. LA-UR-15-26389. 2015. Report.

Presentations

Harrier, Danielle. “Optimization of Ring-Opening Polymerization Encapsulation” 25th Annual NGRPC National Meeting, July. 27th, 2021. Session Chair July 28th.

Harrier, Danielle. “Biodegradable latex: the development of an encapsulation technique for the ring-opening polymerization of cyclic esters” 258th American Chemical Society (ACS) National Meeting, Aug. 26th, 2019.

Conference: American Physics Society- 69th Annual Fluid Dynamics Meeting- Portland, OR, Fall 2016. Harrier, Danielle. “Analysis of xRAGE and FLAG High Explosive Burn Models with PBX 9404 Cylinder Tests” Los Alamos National Laboratory. LA-UR-16-26076. Aug. 10, 2016.