

Exponent®
Engineering & Scientific Consulting

Soshana Smith, Ph.D.

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Professional Profile

Dr. Smith is a fiber and textile scientist who specializes in non-woven technologies and polymers used in renewable energy sources. Her research interests include the development and characterization of non-woven materials for use in high performance lithium ion batteries as well as investigation of the material reliability of photovoltaic backsheets. Dr. Smith has experience working in a start-up environment, as well as federal and academic labs. She routinely utilizes a variety of techniques for the design and characterization of polymeric materials including mechanical and thermal analysis (DMA, DSC, and TGA), microscopy (optical, SEM, TEM), and spectroscopy (FTIR, UV-Vis, and confocal fluorescence).

Before joining Exponent, Dr. Smith worked as a scientist for Axium Nano LLC where she developed new materials for use in lithium ion batteries. In this position, she co-led a team that designed and optimized production processes both in the lab and pilot scale and her team was able to develop a patented polymer/ceramic hybrid separator, which exceeded thermal stability and cycling performance industry standards. In addition to her startup experience, Dr. Smith worked at NIST (National Institute of Standards and Technology) as a Materials Research Engineer where she utilized accelerated weathering techniques to study the degradation of polymer back sheets used for photovoltaic modules.

Academic Credentials & Professional Honors

Ph.D., Fiber Science, Cornell University, 2016

M.S., Fiber Science, Cornell University, 2012

B.S., Chemical Engineering, Cornell University, 2009

NREL PVRW 2022 Outstanding Poster Award - Feb 2022

Materials for a Sustainable Future IGERT Fellowship 2011 - 2013

National Science Foundation EAPSI Fellowship 2011

Licenses and Certifications

Professional Engineer Chemical, California, #CH 7269

Prior Experience

Materials Research Engineer, National Institute for Standards and Technology, 2020-2022

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Post-Doctoral Associate, Cornell University, 2019-2020

Senior Scientist, Axium Nano LLC, 2016-2018

Patents

U.S. Patent No. 20210167463A1: “Polymer-Ceramic Hybrid Separator Membranes, Precursors, And Manufacturing Processes” 2019 (Smith, Soshana; Carlin, Joseph M.; Kim, Kyoung Woo; Joo, Yong Lak)

U.S. Patent No. 20180337379:, “Hybrid separators and the manufacture thereof” 2018 (Joo, Yong Lak, Carlin, Joseph M.; Smith, Soshana)

Publications

S.A. Smith., S. Mitterhofer, S.L. Moffitt et al. Long-term durability of transparent backsheets for bifacial photovoltaics: An in-depth degradation analysis. Solar Energy Materials and Solar Cells. 256 (2023) 112309.

S.A. Smith, L. Perry, S. Watson, et al. Transparent backsheets for bifacial photovoltaic (PV) modules: Material characterization and accelerated laboratory testing. Prog Photovolt Res Appl. (2021); 1- 11.

S.A. Smith; M. Ozturk; M.W. Frey, Biodegradation of Cotton Fabrics Treated with Common Finishes. Cellulose (2021)

S.A. Smith; K.E. Goodge, M.J. Delaney, A.A. Struzyk, N.L. Tansey, M.W. Frey, A Comprehensive Review of The Covalent Immobilization of Biomolecules onto Electrospun Nanofibers. Nanomaterials, 10 (2020) 2142.

S.A. Smith; M.J. Delaney; M.W. Frey, Anti-Escherichia coli Functionalized Silver-Doped Carbon Nanofibers for Capture of E. coli in Microfluidic Systems. Polymers. 12 (2020) 1117.

S.A. Smith, J.H. Park, B.P. Williams, Y.L. Joo, Polymer/ceramic co-continuous nanofiber membranes via room-curable organopolysilazane for improved lithium-ion battery performance, Journal of Materials Science. 52 (2017) 3657–3669.

S.A. Smith, B.P. Williams, Y.L. Joo, Effect of polymer and ceramic morphology on the material and electrochemical properties of electrospun PAN/polymer derived ceramic composite nanofiber membranes for lithium ion battery separators, Journal of Membrane Science. 526 (2017) 315–322.

J. Kim, J.M. Carlin, S.A. Smith, J. Yin, Y.L. Joo, Thermal restacking of graphene structure to improve lithium-air battery cyclability, Electrochemistry Communications. 70 (2016) 43–46.