



Exponent®

Engineering & Scientific Consulting

Yiwen Zhang, Ph.D.

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Professional Profile

Dr. Zhang specializes in material science and engineering with a focus on advanced energy materials for lithium-ion batteries. She is experienced with the synthesis and characterization of electrodes with nano-architectures and electrolyte engineering such as formulation of electrolytes for various applications.

Dr. Zhang has proficient experience in material characterization techniques including scanning electron microscopy (SEM), transmission electron microscopy (TEM), X-ray powder diffraction (XRD), X-ray photoelectron spectroscopy (XPS), Raman spectroscopy, Fourier-transform infrared spectroscopy (FTIR), and differential scanning calorimetry (DSC). Also, her expertise includes electrochemical analysis methods for lithium-ion batteries such as cyclic voltammetry (CV), electrochemical impedance spectroscopy (EIS), and Coulombic efficiency (CE).

Prior to joining Exponent, Dr. Zhang worked as a graduate research assistant at Thayer school of engineering, Dartmouth College. Her research mainly focused on the designing and formulation of electrolytes to tackle the problems in lithium metal batteries under harsh environmental conditions and the next-generation sodium-sulfur batteries. In addition, she worked as an intern at Apple Inc., supporting the failure analysis and material characterization tasks of lithium-ion batteries in consumer electronics for new technology introduction.

Academic Credentials & Professional Honors

Ph.D., Engineering Sciences, Dartmouth College, 2023

B.S., Chemistry, Nankai University, China, 2017

Prior Experience

Battery Failure Analysis Intern, Hardware Technology, Apple Inc., 2022

Teaching & Research Assistant, Thayer School of Engineering, Dartmouth College, 2018-2022

Publications

Zhang Y, Luo J, Wang C, Hu X, Matios E, Li W. Electrolyte Additive Enabled Low Temperature Lithium Metal Batteries. *Materials Chemistry Frontiers* 2022; 11: 1405-1413.

Hu X, Zhang Y, Wang P, Mtios E, Li W. Suppression of Gas Crossover and Dendrite Growth in Sodium-Gas Batteries Across a Wide Operating Temperature Range. *ACS Nano* 2022; 16: 17965-17972.

Luo J, Zhang Y, Matios E, ... Li W. Stabilizing Sodium Metal Anodes with Surfactant-based Electrolytes and Unraveling Atomic Structure of Interfaces by Cryo-TEM. Nano Letters 2022;22: 1382-1390.

Eng A*, Kumar V*, Zhang Y*, ... Li W and Seh ZW. Room-Temperature Sodium-sulfur Batteries and Beyond: Realizing Practical High Energy Systems through Anode, Cathode, and Electrolyte Engineering. Advanced Energy Materials 2021; 11: 2003493.

Wang C*, Zhang Y*, Zhang Y, ... Li W. Stable Sodium-Sulfur Electrochemistry Enabled by Phosphorus-Based Complexation. Proceedings of the National Academy of Sciences 2021;118: e2116184118.

Presentations

Zhang Y, Ultra-low temperature Li metal batteries enabled by highly resilient solid-electrolyte interphase. Oral presentation, the 242nd Electrochemical Society Meeting, Atlanta, GA, 2022.

Zhang Y, Electrolyte additive enabled low-temperature Li metal battery. Oral presentation, Materials Research Society 2021 Fall Meeting and Exhibit, Boston, MA, 2021.

Project Experience

Developed electrochemistry test and material characterization protocols for battery failure analysis purposes. Routinely conducted experiments determine root causes of material degradation in field returned batteries. Held literature review sessions on latest technology advancements to support the research and development team.