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Professional Profile

Dr. Ha specializes in electrochemical analysis of batteries and characterization of their components via spectroscopic, microscopic, and calorimetric techniques. She has significant experience in developing advanced materials for Li-ion and next-generation battery chemistries.

Dr. Ha is also highly skilled in cell fabrication and testing using various platforms. Her fundamental electrochemistry background and applied battery R&D experience bring unique perspectives on identifying the key degradation mechanisms of battery systems.

Prior to joining Exponent, Dr. Ha was a Staff Scientist at the National Renewable Energy Laboratory (NREL). Her research focused on exploring Li-ion chemistries for stationary applications (Behind-the-Meter Storage Project, Materials Team Lead) and developing Si anodes for electric vehicle batteries (Silicon Consortium Project, Subtask PI). Prior to her time at NREL, Dr. Ha was a Research Scientist at LG Chem, where she developed Li metal anodes, functionalized separators, and novel electrolytes for Li-S batteries.

Academic Credentials & Professional Honors

Ph.D., Chemistry, University of Illinois, Urbana-Champaign, 2017

B.S., Chemistry, Hanyang University, South Korea, 2012

Prior Experience

Staff Scientist, NREL, 2020-2022

Postdoctoral Researcher, NREL, 2019-2020

Research Scientist, LG Chem, 2017-2019

Intern, United Nations Environment Programme, 2015-2016

Professional Affiliations

The Electrochemical Society (ECS)

Languages

Korean

Publications

Zhang Y, Teeter G, Kim YJ, Park K, Burrell A, Ha Y. Improving the Long-term Cycle Performance of xLi2MnO3·(1-x)LiMeO2/Li4Ti5O12 Cells via Prelithiation and Electrolyte Engineering. Journal of The Electrochemical Society 2023; 170:090521.

Ha Y, Trask SE, Zhang Y, Jansen AN, Burrell A. Designing Li4Ti5O12/LiMn2O4 Cells: Negative-to-Positive Ratio and Electrolyte. Journal of The Electrochemical Society 2023; 170:050520.

Huey Z, Ha Y, Frisco S, Norman A, Teeter G, Jiang C-S, DeCaluwe SC. Multi-modal Characterization Methods of Solid-Electrolyte Interphase in Silicon-Graphite Composite Electrodes. Journal of Power Sources 2023; 564:232804.

Ha Y, Martin TR, Frisco S, Rynearson L, Schulze MC, Han SD, Trask SE, Lucht BL, Teeter G, Neale NR. Evaluating the Effect of Electrolyte Additive Functionalities on NMC622/Si Cell Performance. Journal of The Electrochemical Society 2022; 169:070515.

Usseglio-Viretta FLE, Colclasure AM, Dunlop AR, Trask SE, Jansen AN, Abraham DP, Rodrigues, MTF, Dufek EJ, Tanim TR, Chinnam PR, Ha Y, Smith K. Carbon-Binder Weight Loading Optimization for Improved Lithium-ion Battery Rate Capability. Journal of The Electrochemical Society 2022; 169:070519.

Korff D, Colclasure AM, Ha Y, Smith KA, DeCaluwe SC. Pathways Toward High-Energy Li-Sulfur Batteries, Identified via Multi-reaction Chemical Modeling. Journal of The Electrochemical Society 2022; 169:010520.

Ha Y, Schulze MC, Frisco S, Trask SE, Teeter G, Neale NR, Veith GM, Johnson CS. Li2O-based Cathode Additives Enabling Prelithiation of Si Anodes. Applied Sciences 2021; 11:12027.

Ha Y, Colclasure AM, Trask SE, Ahmed S, Gering KL, Jansen AN, Burrell A, Park K. Impact of Electrode Thickness and Temperature on the Rate Capability of Li4Ti5O12/LiMn2O4 Cells. Journal of The Electrochemical Society 2021; 168:110536.

Ha Y, Finegan DP, Colclasure AM, Trask SE, Keyser M. Evaluating Temperature Dependent Degradation Mechanisms of Silicon-Graphite Electrodes and the Effect of Fluoroethylene Carbonate Electrolyte Additive. Electrochimica Acta 2021; 394:139097.

Maughan AM, Ha Y, Pekarek RT, Schulze MC. Lowering the Activation Barriers for Lithium-Ion Conductivity through Orientational Disorder in the Cyanide Argyrodite Li6PS5CN. Chemistry of Materials 2021; 33:5127–5136.

Ha Y, Harvey SP, Teeter G, Colclasure AM, Trask SE, Jansen AN, Burrell A, Park K. Long-term Cyclability of Li4Ti5O12/LiMn2O4 Cells using Carbonate-based Electrolytes for Behind-the-Meter Storage Applications. Energy Storage Materials 2021; 38:581–589.

Li Z, Stetson C, Teeter G, Norman A, Ha Y, Tremolet de Villers BJ, Huey Z, Walker P, Han SD, DeClauwe SC, Jiang CS, Burrell A, Zakutayev A. Improving Interface Stability of Si Anodes by Mg Coating in Li-ion Batteries. ACS Applied Energy Materials 2020; 3:11534–11539.

Ha Y, Stetson C, Harvey SP, Teeter G, Tremolet de Villers BJ, Jiang CS, Schnabel M, Stradins P, Burrell A, Han SD. Effect of Water Concentration in LiPF6-Based Electrolytes on the Formation, Evolution, and Properties of the Solid Electrolyte Interphase on Si Anodes. ACS Applied Materials & Interfaces 2020; 12:49563–49573.

Schnabel M, Arca E, Ha Y, Stetson C, Teeter G, Han SD, Stradins P. Enhanced Interfacial Stability of Si Anodes for Li-ion Batteries via Surface SiO2 Coating. ACS Applied Energy Materials 2020; 3:8842–8849.

Ha Y, Tremolet de Villers BJ, Li Z, Xu Y, Stradins P, Zakutayev A, Burrell A, Han SD. Probing the Evolution of Surface Chemistry at the Silicon-Electrolyte Interphase via In-Situ Surface-Enhanced Raman Spectroscopy. The Journal of Physical Chemistry Letters 2020; 11:286–291.

Ha Y, Oberst JL, Zeng Z, Hoang TTH, Cohen Y, Wetzel DJ, Nuzzo RG, Greeley J, Gewirth AA. In Situ Surface Stress Measurement and Computational Analysis Examining the Oxygen Reduction Reaction on Pt and Pd. Electrochimica Acta 2018; 260:400–406.

See KA, Liu YM, Ha Y, Barile CJ, Gewirth AA. Effect of Concentration on the Electrochemistry and Speciation of the Magnesium Aluminum Chloride Complex Electrolyte Solution. ACS Applied Materials & Interfaces 2017; 9:35729–35739.

Ha Y, Zeng Z, Barile CJ, Chang J, Nuzzo RG, Greeley J, Gewirth AA. Dynamic Surface Stress Response during Reversible Mg Electrodeposition and Stripping. Journal of The Electrochemical Society 2016; 163:A2679–A2684.

Ha Y, Zeng Z, Cohen Y, Greeley J, Gewirth AA. Electrochemical Surface Stress Development during CO and NO Oxidation on Pt. The Journal of Physical Chemistry C 2016; 120:8674–8683.

Presentations

Ha Y, Tabatabai JI, Carroll GM, Schulze MC, Finegan DP, Keyser M. Evaluating Thermal Stability of Si Electrodes. Poster presentation, 2022 Batteries Gordon Research Conference, Ventura, CA, 2022.

Ha Y. Lithium-ion Batteries for Behind-the-Meter Storage Applications. Invited talk, 2nd Edition of Webinar on Chemistry, Virtual, 2021.

Ha Y, Finegan DP, Colclasure AM, Trask SE, Keyser M. Evaluating Temperature Dependent Capacity Fade Mechanisms of Silicon-Graphite Electrodes. Oral presentation, 2020 MRS Fall Meeting, Virtual, 2020.

Ha Y, Tremolet de Villers BJ, Li Z, Xu Y, Stradins P, Zakutayev A, Burrell A, Han SD. Probing the Evolution of Surface Chemistry at the Silicon-Electrolyte Interphase via In-Situ Surface-Enhanced Raman Spectroscopy. Poster presentation, 2020 Batteries Gordon Research Conference, Ventura, CA, 2022.

Ha Y, Schnabel M, Tremolet de Villers BJ, Harvey SP, Stetson C, Arca E, Stradins P, Jiang CS, Teeter G, Han SD. The Effect of Water Concentration in Carbonate-Based Electrolytes on the Si Anode/Electrolyte Interface. Oral presentation, 236th ECS Meeting, Atlanta, GA, 2019.

Ha Y, Ambrosio RC, Gewirth AA. Identification of Glycerol Oxidation Products on Silver using In Situ Surface-enhanced Raman Spectroscopy. Poster presentation, 252nd ACS National Meeting, Philadelphia, PA, 2016.

Ha Y, Zeng Z, Barile CJ, Chang J, Nuzzo RG, Greeley J, Gewirth AA. Dynamic Surface Stress Response during Reversible Mg Electrodeposition and Stripping. Oral presentation, 252nd ACS National Meeting, Philadelphia, PA, 2016.

Ha Y, Cohen Y, Gewirth AA. Electrochemical Stress Development during CO and NO Oxidation on Pt. Oral presentation, 227th ECS Meeting, Chicago, IL, 2015.