Northeastern University
College of Engineering

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Hosted by the Department of Chemical Engineering

Distinguished Seminar Speaker

Probe the Dynamic Interfaces of Beyond Lithium-ion Energy Storage Systems

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Abstract: Rapid growth of technology in the past few decades has spurred a demand for advanced energy storage devices. The invention of a more advanced battery system with higher levels of performance will be a groundbreaking discovery in the rechargeable battery field. Multivalent chemistry offers promising benefits in the development of beyond lithium-ion technologies. The direct usage of the multivalent metal anode is essential to enhance the energy density of the multivalent ion battery. For instance, Magnesium, Calcium and Zinc offer an immense alternative to the existing Li-ion batteries due to their multivalent nature and vast abundance in the Earth's crust. However, possible film formation at the solid/liquid interface complicates the electrochemical properties of such systems. The least understood solid electrolyte interphase (SEI), its formation and dynamic evolution has not been extensively explored for multivalent battery systems with many unknowns remain to be answered. We aim to use electroanalytical tools to probe the dynamic evolution of the solid electrolyte interface *in-situ* for multivalent systems and investigate its correlation with the electrochemical processes. This presentation focuses on some very recent research findings from our team for understanding the interfacial chemistry, evolution, and stability for different multivalent battery systems.

Biography: Professor Niya Sa is an Associate Professor in the Department of Chemistry at the University of Massachusetts Boston. She received her Ph.D. from the Analytical Chemistry (Electroanalytical Chemistry) program at Indiana University-Bloomington, where she worked with Professor Lane A. Baker on understanding fundamental ion transport phenomena in confined regime. She extended her training working as a postdoc research fellow at the Electrochemical Energy Storage Division at Argonne National Lab. Her research focus at Argonne was to develop beyond lithium-ion battery materials. She joined the University of Massachusetts in 2017 as an Assistant Professor, and her current research interests include probing the electrochemical interfaces for energy materials, development of new electrolytes for next-generation energy storage systems. Niya is a recipient of the NSF CAREER Award. She also received the Endowed Faculty Career Development Award, Joseph P. Healey Award, and the Early Career Research Excellence Award from University of Massachusetts.

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