Exploring the Scope of Electrodeposited Organic-Inorganic Nanohybrids for Energy Storage and Electrocatalytic Applications

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Chemistry Seminar on *Energy and Electrocatalytic Applications of Electrodeposited Organic-inorganic Nanohybrids*

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Abstract: Organic-inorganic nanohybrids represent an exciting class of multifunctional materials with significant promises for advanced energy storage and conversion technologies. This presentation summarizes the strategic synthesis of electrodeposited organic-inorganic nanohybrids, exploiting synergistic interactions between organic components - primarily benzo[2,1,3]selenadiazole-5-carbonyl capped peptides - and inorganic metal hydroxides, such as nickel hydroxide. Using various electrodeposition techniques, including potentiostatic and pulsed methods, nanohybrids with controlled nanoscale morphologies and superior electrochemical properties have been developed. These nanohybrids exhibit impressive capacitive behavior, achieving high specific capacitance and remarkable stability. Collectively, these findings highlight the potential of electrodeposited organic-inorganic nanohybrids as robust, binder-free electrodes for sustainable energy technologies, laying a foundation for future advancements in electrochemical energy storage and conversion applications.

About the speaker: Dr. Rohit G. Jadhav is a Postdoctoral Researcher at the Kummer Institute Center for Resource Sustainability and the Department of Chemistry at Missouri University of Science and Technology, working with Prof. Shelley D. Minteer. He received his Ph.D. in Organic Chemistry from the Department of Chemistry, Indian Institute of Technology Indore (IIT Indore), India, in 2021, under the guidance of Prof. Apurba K. Das. He previously worked as a Postdoctoral Research Associate at the University of Utah with Prof. Shelley D. Minteer. His research focuses on synthesizing redox-active molecules and polymers for electrochemical applications.