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Higher Coordination Sphere-Enabled Molecular Electrocatalysis

ABSTRACT: My group is focused on developing molecular electrocatalysts for small molecular transformations, particularly CO₂ and proton reaction. We are interested in designing tailored 3-dimensional architectures with outer functional spheres to enable main group-element and metal-free catalysis. In this talk, I will present our recent work on the design, synthesis, and catalysis evaluation on a porphyrin-based molecular catalyst with a flexible triazole bundle as a higher coordination sphere. Spectroscopy, voltammetry and isotopic effect techniques will be discussed as useful tools to investigate catalytic processes to gain mechanistic insights.

BIO: Dr. Jiang earned his B.S. from Jiangnan University in 2007 and M.S. from East China University of Science and Technology in 2010 (advisor: He Tian). He obtained his Ph.D. from North Carolina State University (advisor: Jonathan Lindsey) working on tetrapyrrole compounds for energy applications. In 2015, he joined Yale University as a Postdoctoral Associate and then an Associate Research Scientist in the Department of Chemistry and Yale Energy Sciences Institute, working with Professors Gary Brudvig and Robert Crabtree on organometallic materials for small molecule activation and energy storage. Jimmy started his independent career as an Assistant Professor in the Department of Chemistry at the University of Cincinnati in 2018. He received the NSF CAREER award in 2021.