



Inorganic Chemistry Seminar Series

Tuesday, March 19, 2019, 12:30 pm

Seaver Science Library, Room 150

SSC Auditorium next to the library

Professor Yujie Sun

Department of Chemistry and Biochemistry

University of Cincinnati

Innovative Strategies for Nonconventional Water Splitting and Beyond

A lack of competent and inexpensive electrocatalysts remains an obstacle to realizing large-scale H₂ production from water electrolysis. Our group recently discovered that surface modification of metallic nickel with nitrogen resulted in a superior electrocatalyst for H₂ evolution under neutral conditions, rivaling the performance of state-of-the-art platinum-based catalysts. In addition, since water oxidation is more kinetically challenging while its product O₂ is not of significant value, we are also interested in exploring alternative oxidation reactions that can not only provide electrons for H₂ evolution at the cathode but also yield value-added organic products at the anode. Within this context, biomass-derived intermediate compounds are found to be suitable candidates for electrocatalytic upgrading, which can be integrated with H₂ production under alkaline conditions. Finally, a new electrolyzer design for decoupled water splitting and organic transformation will be presented, which is able to substantially reduce voltage inputs and mitigate the H₂/O₂ mixing issue commonly encountered in conventional water electrolysis.

Hosted by Professor Smaranda Marinescu

The scientific community is invited

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