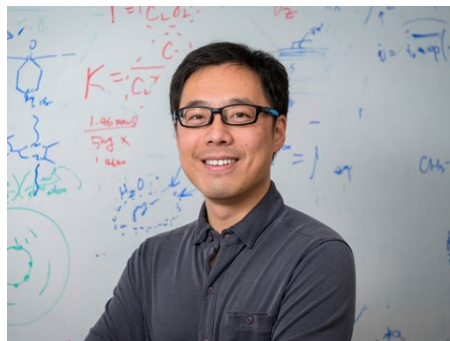


Understanding Electrocatalytic CO₂ and CO Reduction at the Molecular Level (a joint IBNS/TcSUH Seminar)



Dr. Bingjun Xu

College of Chemistry and Molecular Engineering
Peking University

9:00 am, Friday, April 9, 2021

Room: Zoom*

<https://uofh.zoom.us/j/845619943?pwd=QlZvYUV6M2dxNDkvNWxBd3F2YzdJZz09>

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LECTURE ABSTRACT

Electrocatalysis powered by renewable energy is expected to play a pivotal role in the global decarbonization process. In particular, electrocatalytic CO₂ and CO reduction reactions (CO(2)RR) are widely considered as indispensable components in the valorization of CO₂. Much recent research effort has been devoted to the development of efficient and selective catalysts for valuable C₂+ products on Cu surfaces, however, many open questions regarding how species in the electrochemical interfaces impact the activity and selectivity remain. In this lecture, recent efforts in understanding the impact of the surface speciation, adsorbed reaction intermediates and near surface species on the CO(2)RR at the molecular level. Mechanistic investigations on the electroreductive C-C coupling reactions leading to C₃+ products will also be covered briefly. In-situ/operando surface enhanced vibrational spectroscopies, i.e., surface enhanced infrared and Raman spectroscopies, prove to be enabling tools in the identification of active sites and elucidation of reaction mechanisms. The interconnected nature of species at the electrochemical interface makes the assignment of their individual roles in electrocatalytic processes challenging, but also offers ample opportunities for future interfacial engineering in renewable energy devices.

SPEAKER BIOSKETCH

Bingjun Xu is the Ge Li and Ning Zhao Chair Professor at the College of Chemistry and Molecular Engineering of Peking University. Dr. Xu received his Ph.D. in Physical Chemistry, advised by Profs. Friend and Madix, from Harvard University in 2011, and then worked with Prof. Davis at Caltech as a postdoctoral researcher. He started his independent research career in the Department of Chemical & Biomolecular Engineering at University of Delaware in 2013 as an Assistant Professor, and was promoted to a Centennial Development Associate Professor in 2019. Dr. Xu joined the College of Chemistry and Molecular Engineering of Peking University in 2020. The current research interest of the Xu lab spans heterogeneous catalysis, electrocatalysis and in-situ/operando spectroscopy. Dr. Xu is an awardee of US NSF Early Career Award (2017), US Air Force Office of Scientific Research Young Investigator Award (2016), ACS Petroleum Research Fund Doctoral New Investigator Award (2015), and the I&EC Class 2018 Influential Researchers (2018).

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