Multiscale Engineering towards Advanced Hybrid Electrocatalysts

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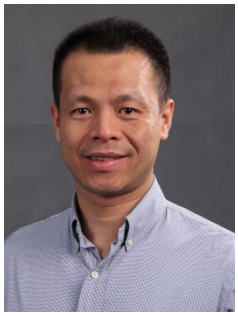
Abstract:

Electrocatalysts play important roles in renewable energy applications. However, in most electrochemical processes, the state-of-the-art catalysts are precious metal based materials, limiting their applications in large scale. Developing cost-efficient electrocatalysts with high activities and good stabilities is highly challenging. This talk will overview our recent work on exploring advanced hybrid electrocatalysts without precious metals by multiscale engineering approaches. The first class of electrocatalysts are metal phthalcyanine/carbon nanotube hybrids for catalyzing carbon dioxide reduction. The second class of electrocatalysts is inorganic nanostructures for catalyzing water splitting.



Speaker bio:

Yongye Liang received his B. Sc. degree in chemistry from Nanjing University in 2003. Then he conducted his graduate research on polymeric materials with Prof. Luping Yu at the University of Chicago, and obtained his Ph.D. degree in 2009. From 2009-2012, he worked as a postdoc associate with Prof. Hongjie Dai at Stanford University on nano-carbon hybrid materials. Liang began his independent faculty career at Southern University of Science and Technology in 2012 and is currently associate professor in the department of materials science and engineering. He serves as an editorial board member for *Molecular Systems Design & Engineering* since 2017.

His primary research interest is molecular engineering, which combines chemical design and synthesis with device studies to develop advanced functional materials for organic electronics, electrocatalysis, and bioimaging. He has authored or co-authored more than 90 peer-reviewed articles with over 24000 total citations.