

Electrocatalytic CO₂ Reduction

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Abstract: The fast and continuous accumulation of greenhouse gases such as carbon dioxide and methane has been bringing a series of irreversible effects on the environment. Using renewable energy sources, the electrochemical conversion of CO₂ and other carbon-based small molecules into value-added products represents a unique and important strategy for realizing carbon-neutral and energy storage. However, the development of high energy-density multi-carbon products has been a substantial challenge, due to the complicate surface structures of heterogeneous catalyst surfaces, slow charge transfer kinetics on gas-liquid-solid interfaces, and competition among multiple reaction pathways. Thus, it requires to rationally design and develop electrocatalysts with high-selectivity, high-activity surface sites. In this talk, I will discuss our recent efforts in developing electrocatalysts for conversion of C1 small molecules toward hydrocarbons, alcohols, acids, and more complex products.^[1-3] The interplays between catalytic centers with reaction pathways will be discussed.

References:

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Biography:



Prof. Gengfeng Zheng obtained his bachelor degree (2000) at Fudan University, and PhD degree (2006) in Chemistry at Harvard University. He was a postdoctoral fellow at Northwestern University in USA (2007–2009). Since 2010, he has been a full professor at Fudan University, and was a recipient of National Science Fund for Distinguished Young Scholars. His research interests focus on the nanomaterial-based electrocatalytic conversion of C1 small molecules.