

Nanostructured Electrocatalysts Based on Nitrides, Carbides and Chalcogenides

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There has been an intense search for efficient (electro)catalysts, especially in the context of improving kinetics of redox reactions involving small molecules. This is particularly useful for electrochemical energy systems such as batteries, fuel cells and supercapacitors that require efficient electrode materials to improve their stability and performance. The interfacial redox reactions generally occur on a solid electrode surface and following the kinetics and mechanism is a considerable challenge. One needs to look for new and novel materials in addition to *in-situ* techniques that could be used.

Our group has been working on transition metal nitrides, carbides and chalcogenides for catalyzing various reactions of interest such as oxygen reduction (ORR), oxygen evolution (OER), hydrogen evolution (HER) and small molecule oxidation (methanol, ethanol etc.). The present lecture will describe some of the developments from our laboratory based the materials mentioned above.

Representative references:

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