

# Nanostructured Materials for Energy Conversion and Storage

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This talk will discuss our effort to develop new approaches to control the synthesis and assembly of multicomponent, multifunctional materials for energy conversion and storage. In the literature, solution based synthesis and self-assembly techniques are widely studied for the synthesis of nanostructured materials, but these methods are usually more effective for the preparation of simple, single phase materials. For energy applications, the performance depends on more than one property, such as redox activity, conductivity, mechanical property and stability. Here, we will discuss how the solution synthesis approach can be used for the self-assembly of true multicomponent and multiphase materials/devices. These new materials are made of ordered arrays of different types of nanostructured materials rather than randomly mixed components which can be obtained from traditional mixing techniques. The nucleation and growth kinetics and the fundamental interfacial interactions that determine the multicomponent self-assembly process, and the applications of the new materials in energy conversion and storage, will be reviewed.

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