

Chemical Transformation of Nanocrystals toward Electrochemical Energy Applications

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Chemical transformations of as-synthesized nanocrystals (NCs) are an emerging and powerful method to tailor the composition and morphology of NCs. Nanosynthetic chemistry has centered on creating new NCs using these transformations. However, beyond works employing empirical qualitative analysis, few works have addressed the underlying atomic mechanisms for these transformations. Works using chemical transformations of NCs for applications are also an under-studied field. This presentation spans from fundamental understandings of the atomic structural evolutions and mechanisms in chemical transformations for NCs, to use of these methods to create and characterize new structures, to the final applied stage of electrochemical energy applications of these chemically transformed materials, such as additive free battery electrodes and electrocatalysts for hydrogen evolution.