

NANOSCIENCE COLLOQUIUM

FuMultimetallic Nanocrystals by Design

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ABSTRACT: The importance of molecular structure to molecular function is a central tenet in modern chemistry and materials science, with the lock-and-key model of enzyme activation representing a classic example. Likewise, the function of inorganic nanomaterials depends on structural parameters that include crystallite size and shape as well as architecture (e.g., hollow versus solid). To realize the function of such materials, these structural parameters must be precisely controlled, and the Skrabalak group is creating the synthetic toolkit to achieve such advanced nanostructures. This seminar will highlight the use of seed-mediated co-reduction as a route to shape-controlled alloy nanoparticles including high entropy alloy materials as well as hierarchical nanocrystals. These synthetic advances, in turn, are enabling previously unimagined nanostructures to be accessed with new function for applications in chemical sensing and electrocatalysis. Ultimately, understanding the relationship between nanostructure form and function will allow this relationship to be inverted to achieve materials by design. Still, the synthetic toolkit must exist to realize this vision and achieve desired nanomaterials on demand.

