

## Shape Control of Inorganic Nanocrystals and Their Assembly for Bio-Medical Applications

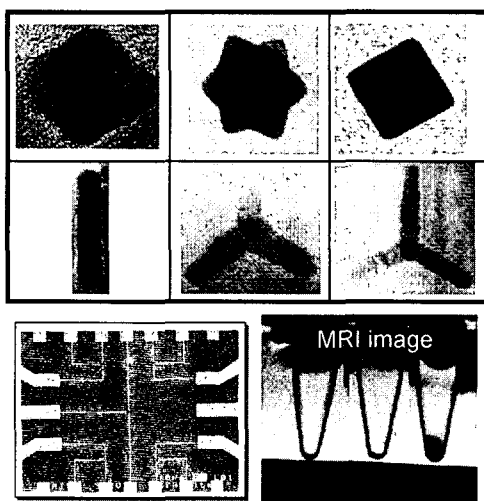
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Inorganic nanocrystals are of current interest due to their novel properties and significant advantages in nano-electronics and bio-medical technology. Here, as a model studying strategy for architectural control toward multi-dimensional structures, in specific, we examine the shape evolution of various semiconductor and magnetic nanocrystals (e.g. wires, cubes, diamonds, and stars) and systematically elucidate the key growth parameters for shape determination of materials.

The resulting size and shape dependent novel properties under quantum mechanical regime are uniquely observed. We demonstrate how to assemble these nanocrystals into desired places needed for the fabrication of nanodevices to generate nice Coulomb blockade effect for a single electron transistor. Also, these nanomaterials show exceptional medical diagnostic properties for detecting cancers and other targeted bio-molecules through our nano-MRI (magnetic resonance imaging) technique. This technique can be extended to detecting other harmful viruses and pathogens otherwise impossible previously.



Architectural motifs of nanocrystals and the fabrication of nano medical devices