

Colloidal Synthesis of Green-emitting CdSeS/CdS Dot-in-Rod Structure for light-emitting device

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We synthesized green-emitting CdSeS/CdS semiconductor dot-in-rod nanocrystals having different aspect ratio. Especially, lack of proper material to emit light with short wavelength makes it harder to synthesize green or blue emitting dot-in-rod structure with sufficiently high quantum yield than red emitting one. Also, we enhanced photoluminescence quantum yield due to introduction of alloying layer and passivation with rod structure. Furthermore, we studied on separation of charge inside the semiconductor dot-in-rod structure which determines how much fluorescence diminishes with electric field on the photoluminescence based light-emitting device. To enhance charge separation in the dot-in-rod structure, we have deposited cadmium halide on the rod shell surface and exchanged the ligand on the rod shell surface into thiolate. Likewise, the enhanced conductive and enhanced luminescent nanocrystals can be a potential candidate of light emitter for quantum dot light emitting diodes and bio-imaging.