

## Bright and Stable Silica-coated Spherical Quantum Well Nanoparticles for Light-Emitting Device

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We present the facile synthesis of highly luminescent spherical quantum well (SQW) CdS/CdSe/CdS@silica nanoparticles that retain around 80% of their pristine quantum yields (QYs) of bare SQW nanoparticles and investigate their thermal- and photo-stability for their application in photoluminescence light-emitting device. The main innovative point here is the utilization of the bright and giant SQW nanoparticles recently developed. These SQW nanoparticles are over-coated by silica shell with controllable thickness and fine morphology through a general water-in-oil microemulsion method. The brightness and ability to retain high quantum efficiency of SQW@silica when undergoing the silica coating process is outstanding through comparison with that of both type I and type II CdSe/CdS@silica. Besides, the stability of these highly luminescent SQW@silica nanoparticles was investigated when these emitters were incorporated into polymer matrix. Thanks to the exist of the silica barrier layer between quantum dots (QDs) and polymer, the damage effect when the QDs went through harsh fabrication process (thermal stability) and long term use (photo stability) was reduced.