

Supporting information

Investigating Photoinduced Charge Transfer in Double- and Single-Emission PbS@CdS Core@shell Quantum Dots

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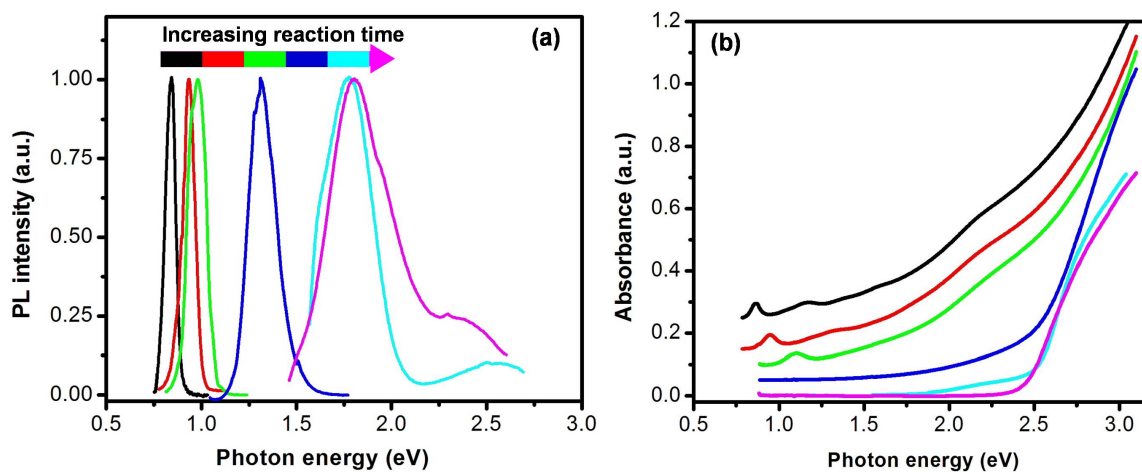


Figure S1 Normalized PL spectra (a) and absorption spectra (b) of QDs with cation exchange reaction time. The diameter of parent PbS QDs is 5.4 nm.

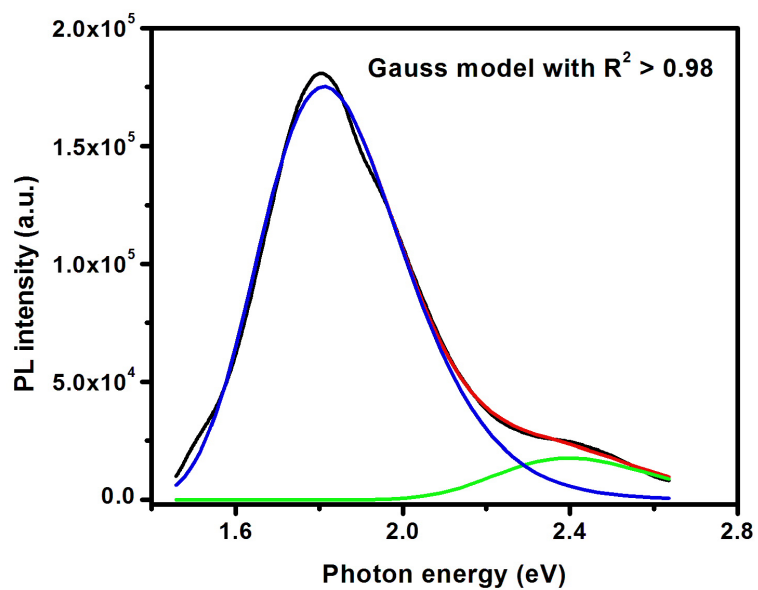


Figure S2 PL spectra (black) of PbS@CdS QDs at 296 K. The red and green lines are fitting curves.

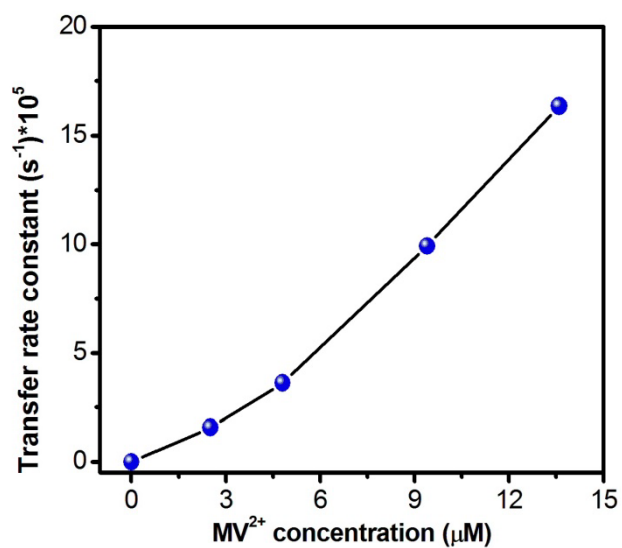


Figure S3 Charge-transfer rate constant from PbS core to MV^{2+} as a function of MV^{2+} concentration. The concentration of QDs is 2.5 μM .

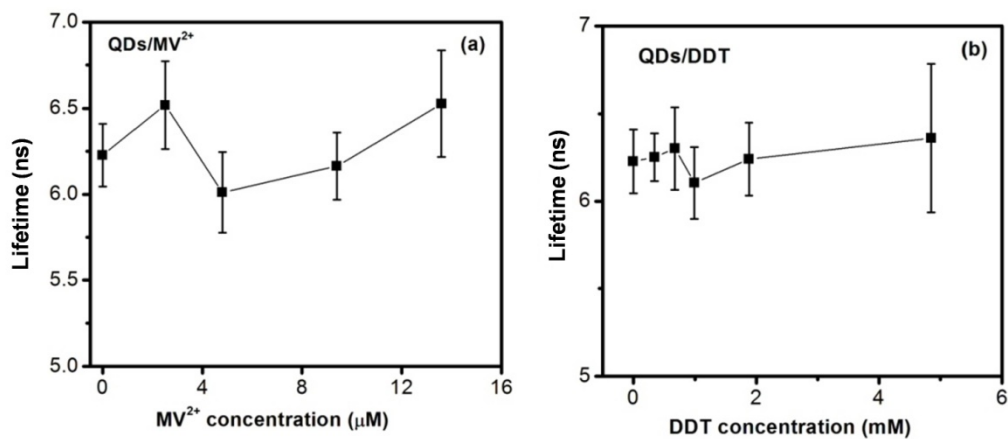


Figure S4 PL lifetime of CdS shell as a function of concentration of MV²⁺ (a) and DDT (b).

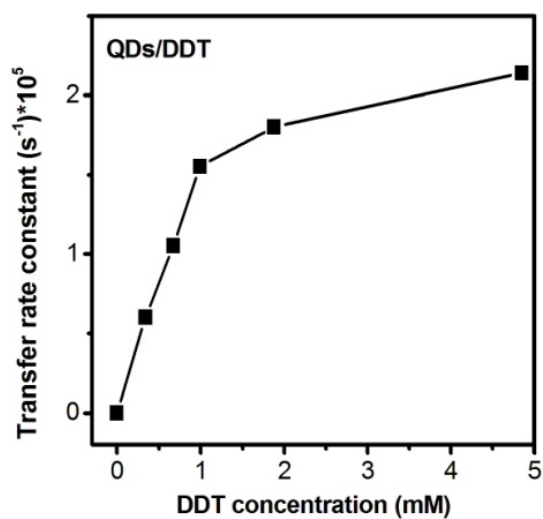


Figure S5 Charge-transfer rate constant from PbS core to DDT as a function of DDT concentration. The concentration of QDs is 2.5 μM.

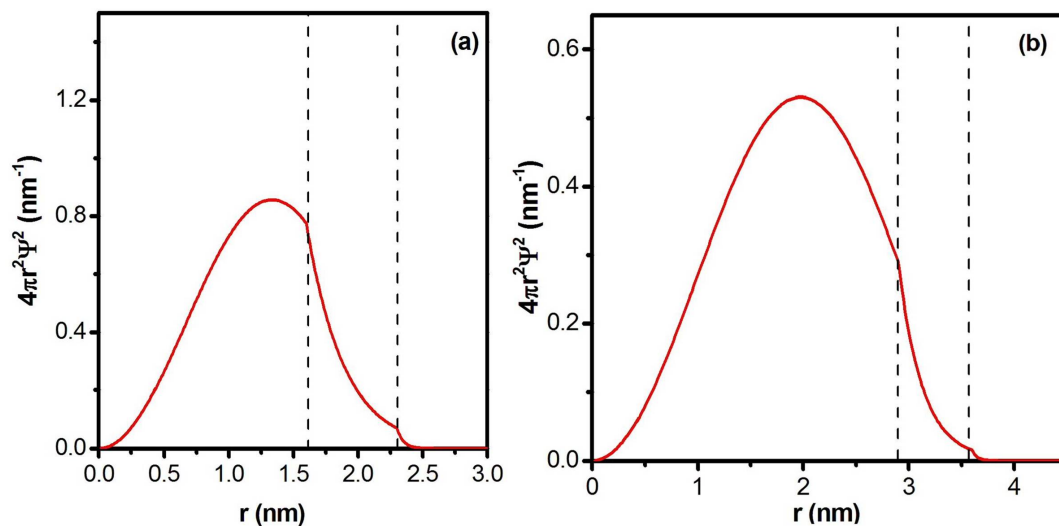


Figure S6 Normalized radial distribution function for the 1S electron level of the PbS@CdS core@shell QDs with the core size of 3.2 nm (a) and 5.8 nm (b) in diameter. The dashed lines indicate core/shell and shell/ligand boundaries.

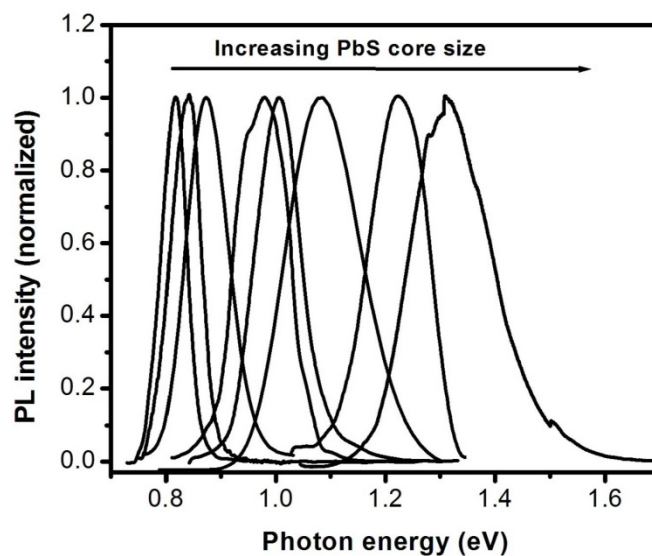


Figure S7 PL spectra of PbS@CdS QDs with constant shell thickness of 0.7 nm and different core size.

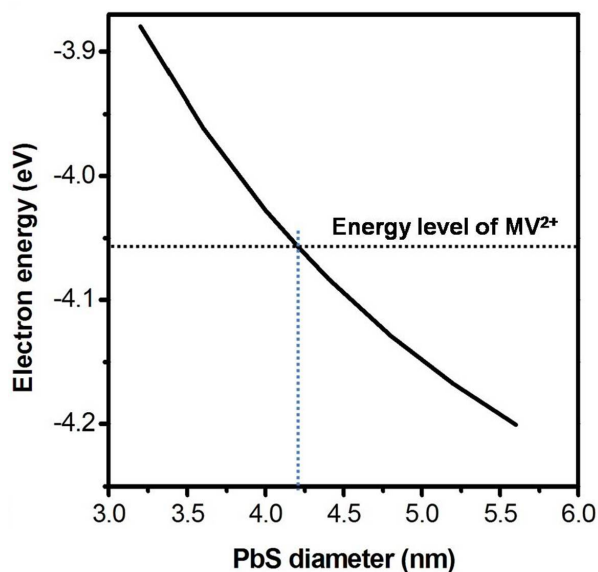


Figure S8 Electron energy level of PbS@CdS core@shell QDs with tunable core size and constant shell thickness of 0.7 nm. The black dotted line highlights the energy level of MV²⁺ (-4.07 eV) and the blue dotted line denotes the diameter of PbS having the same energy as MV²⁺.

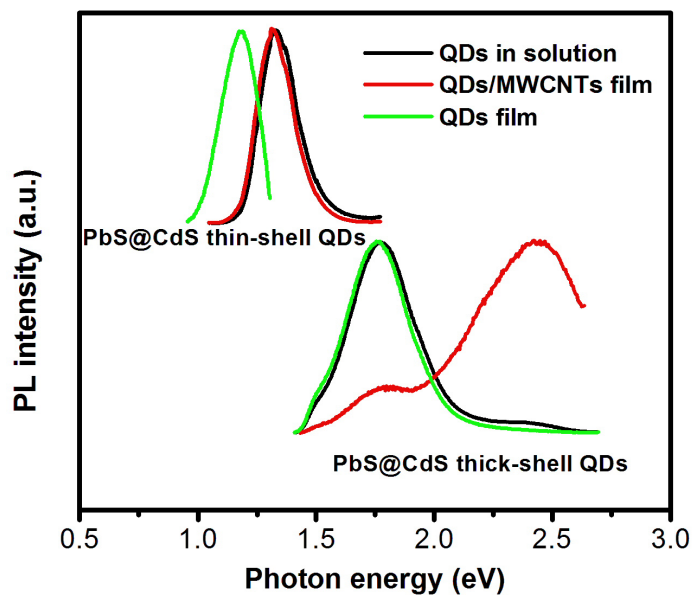


Figure S9. PL of thin-shell (0.7 nm) PbS@CdS and thick-shell PbS@CdS (core size: 1.2 nm; shell thickness: 2.1 nm) QDs in toluene (black), in film (green) and after hybridization with MWCNTs in film (red).