Electronic supplementary information

Unravelling the Role of Surface Traps on Carrier Relaxation and Transfer Dynamics in Ultrasmall Semiconductor Nanocrystals

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TEM and EDS studies

Figure S1a depicts electron diffraction pattern of the CdSe NCs where only one ring is clearly visible which correspond to (002) plane of NCs. EDS spectra of CdSe-3 NCs that is shown in Figure S1b confirms the chemical purity of CdSe NCs.

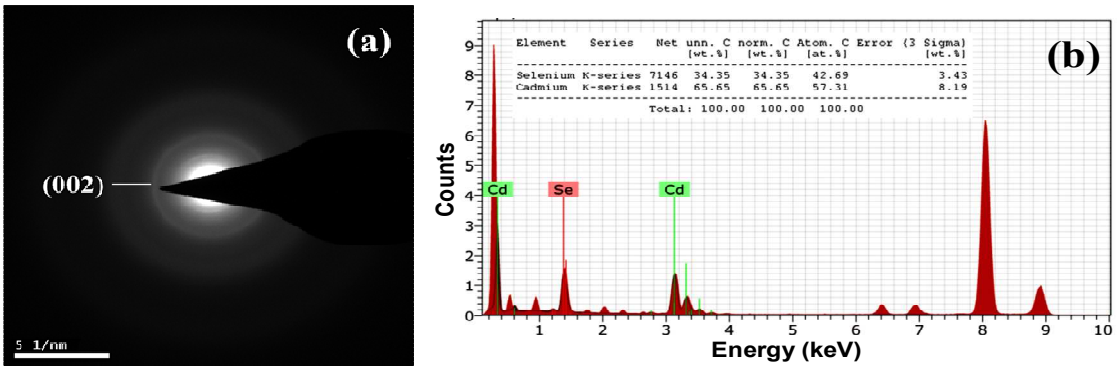

Figure S1. (a) Represents electron diffraction pattern showing only one dominant ring which corresponds to (002) plane of hexagonal CdSe lattice. (b) Energy-dispersive X-ray spectrum (EDS) of NCs that shows the percentage of Cd and Se atoms.

Steady state characterization of ZnO and CdSe NCs

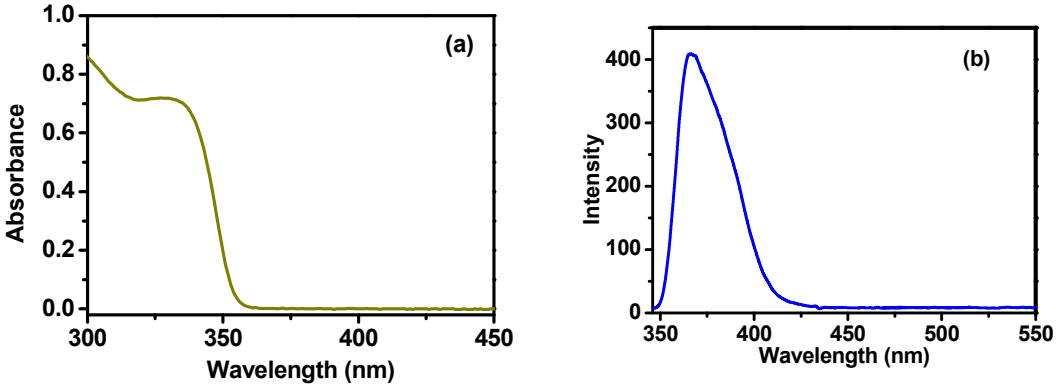

Figure S2. (a) Electronic absorption and (b) emission spectra of ZnO NCs.

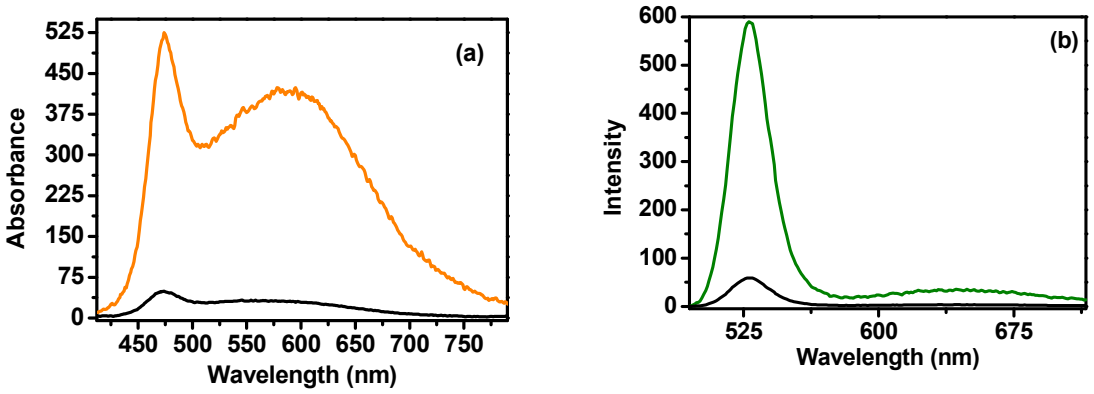

Figure S3. Steady state emission spectra: (a) CdSe-1 (orange) NCs and CdSe-1/ZnO (black) NC assembly, (b) CdSe-3 (olive) NCs and CdSe-3/ZnO (black) NC assembly.

Time-resolved PL kinetics of CdSe NCs

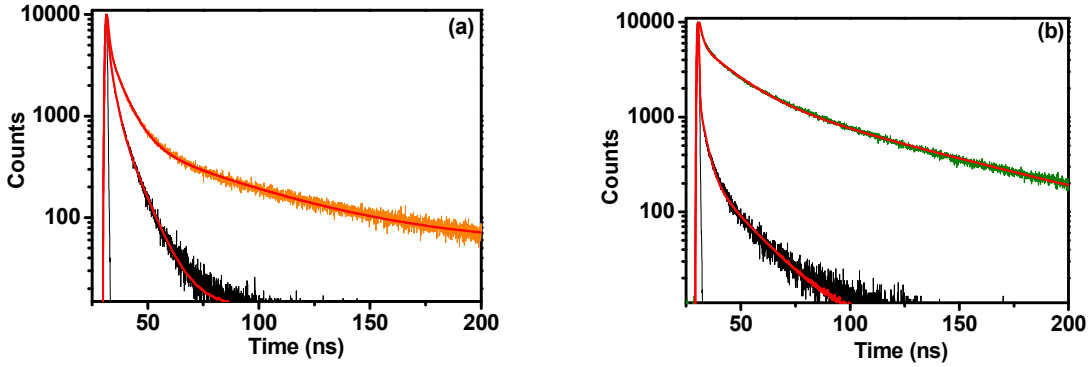

Figure S4. Emission decay kinetics: (a) CdSe-1 (orange) NCs and CdSe-1/ZnO (black) NC assembly, (b) CdSe-3 (olive) NCs and CdSe-3/ZnO (black) NC assembly. Solid red lines are the fitted curves using a triexponential function.

Pump-probe measurements of CdSe NCs

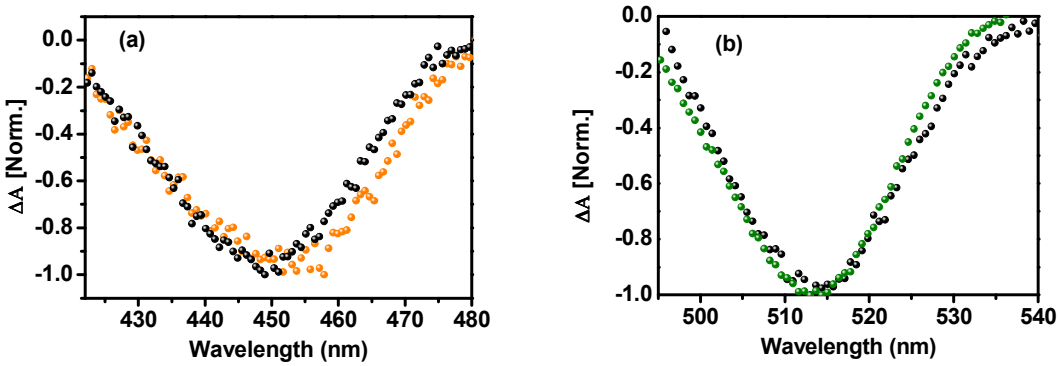

Figure S5. TA spectra at 500 ps: (a) CdSe-1 (orange) NCs and CdSe-1/ZnO (black) NC assembly, (b) CdSe-3 (olive) NCs and CdSe-3/ZnO (black) NC assembly.

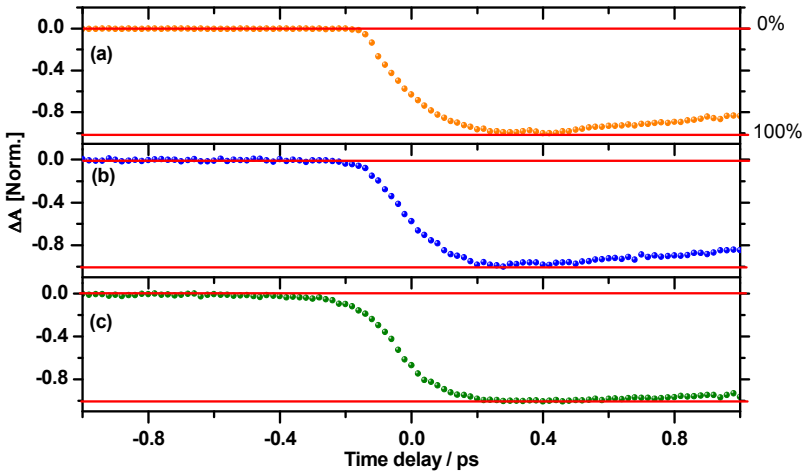

Figure S6. Normalized TA kinetics showing the rise signal for (a) CdSe-1 (orange), (b) CdSe-2 (blue) and (c) CdSe-3 (olive). Excitation fluence per pulse was 8.6×10^{13} photons cm^{-2}.

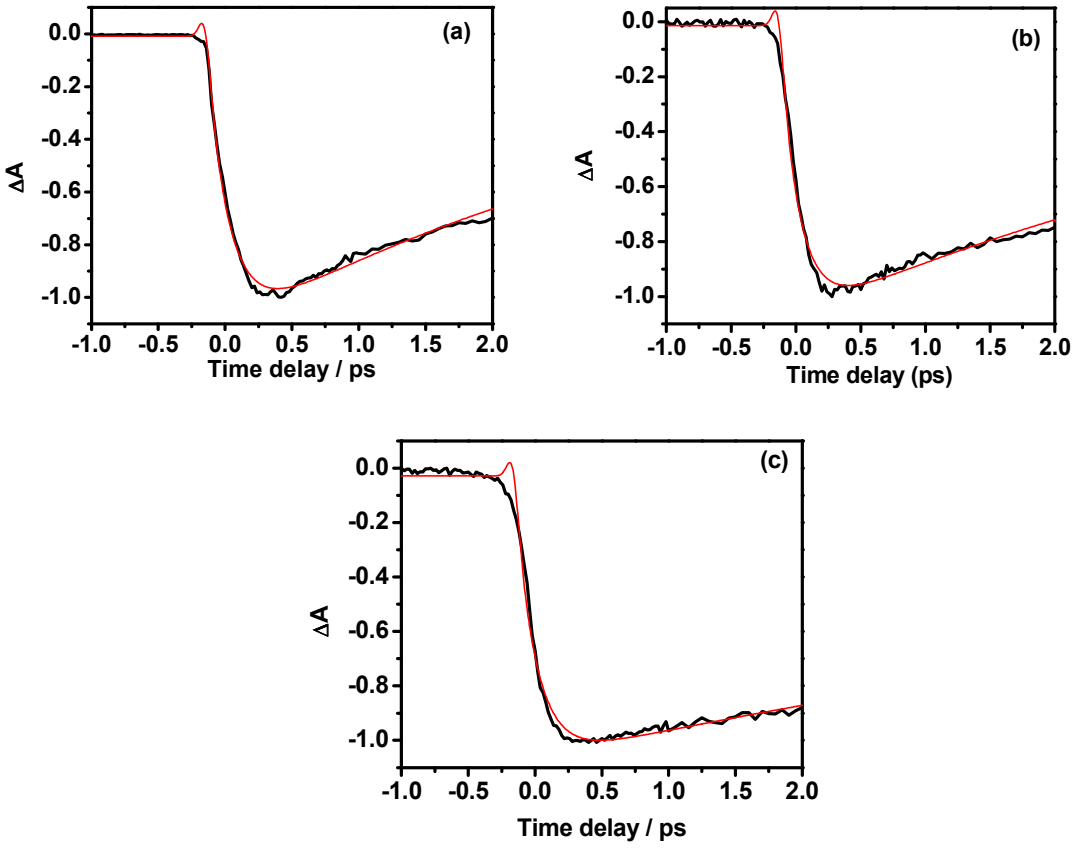

Figure S7. TA kinetics of (a) CdSe-1, (b) CdSe-2 and (c) CdSe-3 NCs. All kinetics were fitted with the function described in equation 3 in the main manuscript.

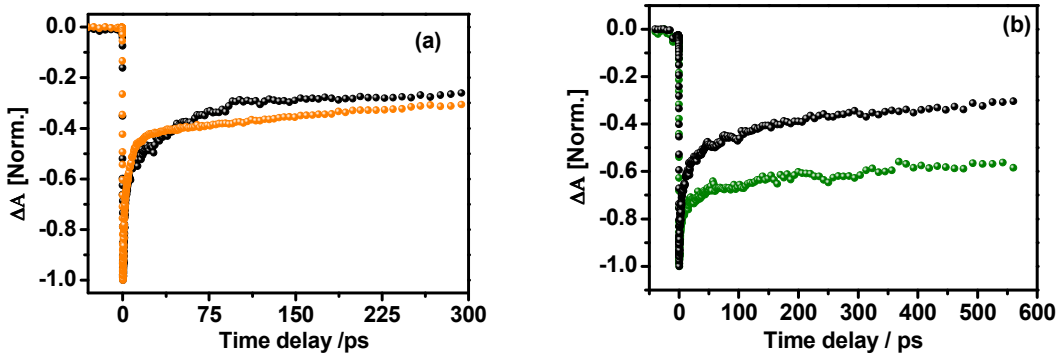

Figure S8. TA kinetics: (a) CdSe-1 (orange) NCs and CdSe-1/ZnO (black) NC assembly; (b) CdSe-3 (olive) NCs and CdSe-3/ZnO (black) NC assembly.