

Supporting information for

Temperature dependent excited state dynamics in dual emissive CdSe nano-tetrapods

Sucheta Banerjee,^a Ashutosh Gupta,^a Rohit Srivastava,^{b*} Anindya Datta^{a*}

^aDepartment of Chemistry and ^bDepartment of Bio Science and Bio Engineering

Indian Institute of Technology Bombay

Powai, Mumbai 400 076

e-mail: anindya@chem.iitb.ac.in (AD), rsrivasta@iitb.ac.in (RS)

Phone: +91 22 2576 7149 (AD), +(91-22) 2576 7746 Fax: +(91-22) 2572 7760

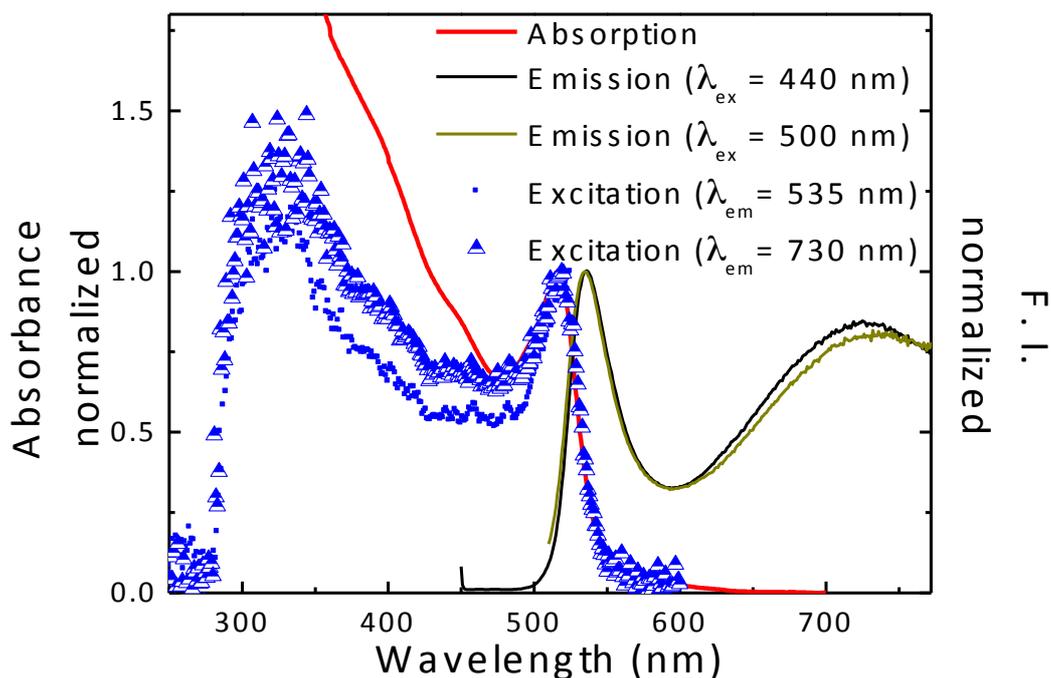


Figure S1. Absorption (red solid line), emission $\lambda_{\text{ex}} = 440$ nm (black solid line), emission $\lambda_{\text{ex}} = 500$ nm (dark yellow solid line) and excitation spectra at band-edge emission ($\lambda_{\text{em}} = 535$ nm, blue filled squares) and excitation spectra at surface state emission ($\lambda_{\text{em}} = 730$ nm, blue half-filled triangles) of 1 minute aliquots of CdSe nano-tetrapods are shown. λ_{ex} and λ_{em} are the excitation and emission wavelength for the corresponding emission and excitation spectra. The absorption and excitation spectra are normalized at the lowest energy peak. Emission spectra is normalized with respect to band-edge emission at 535 nm. Proper overlap of absorption and excitation spectra proves the absence of impurity in the synthesized nano-tetrapods. The dual emission is observed independent of excitation wavelength.

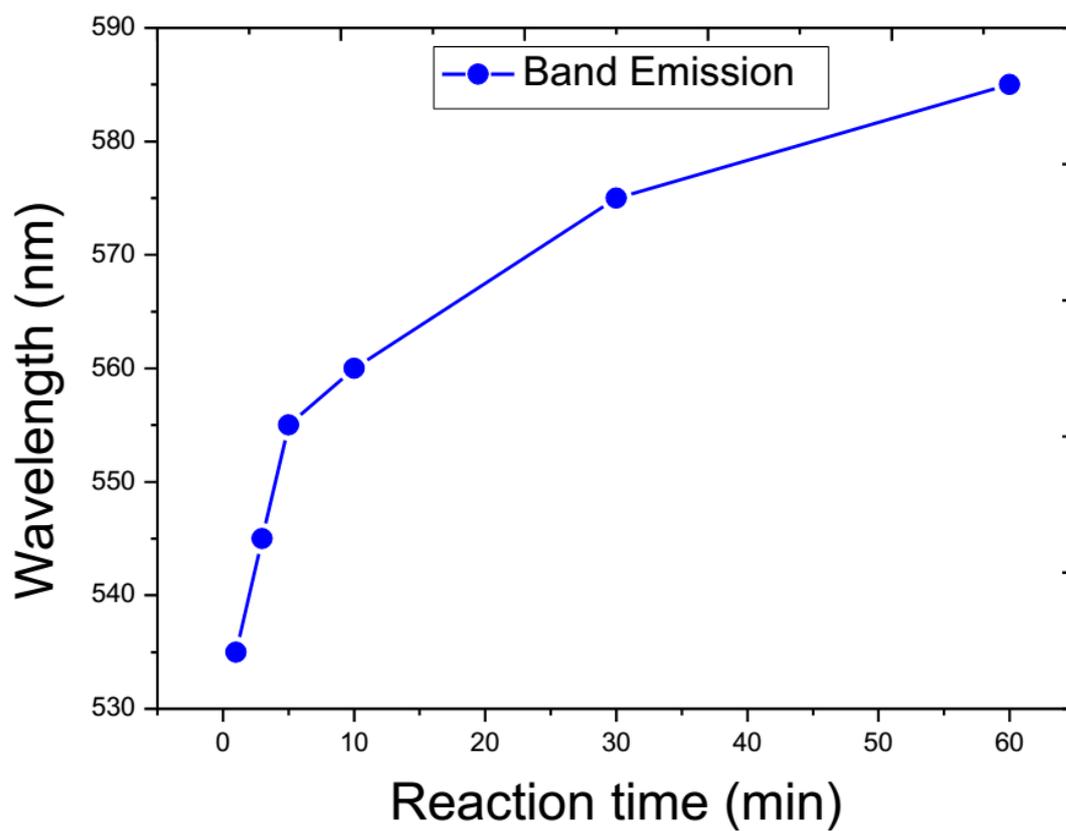


Figure S2. Band-edge emission peak position of CdSe nano-tetrapod aliquots upto 60 minute reaction time indicates the growth of the nanocrystals.

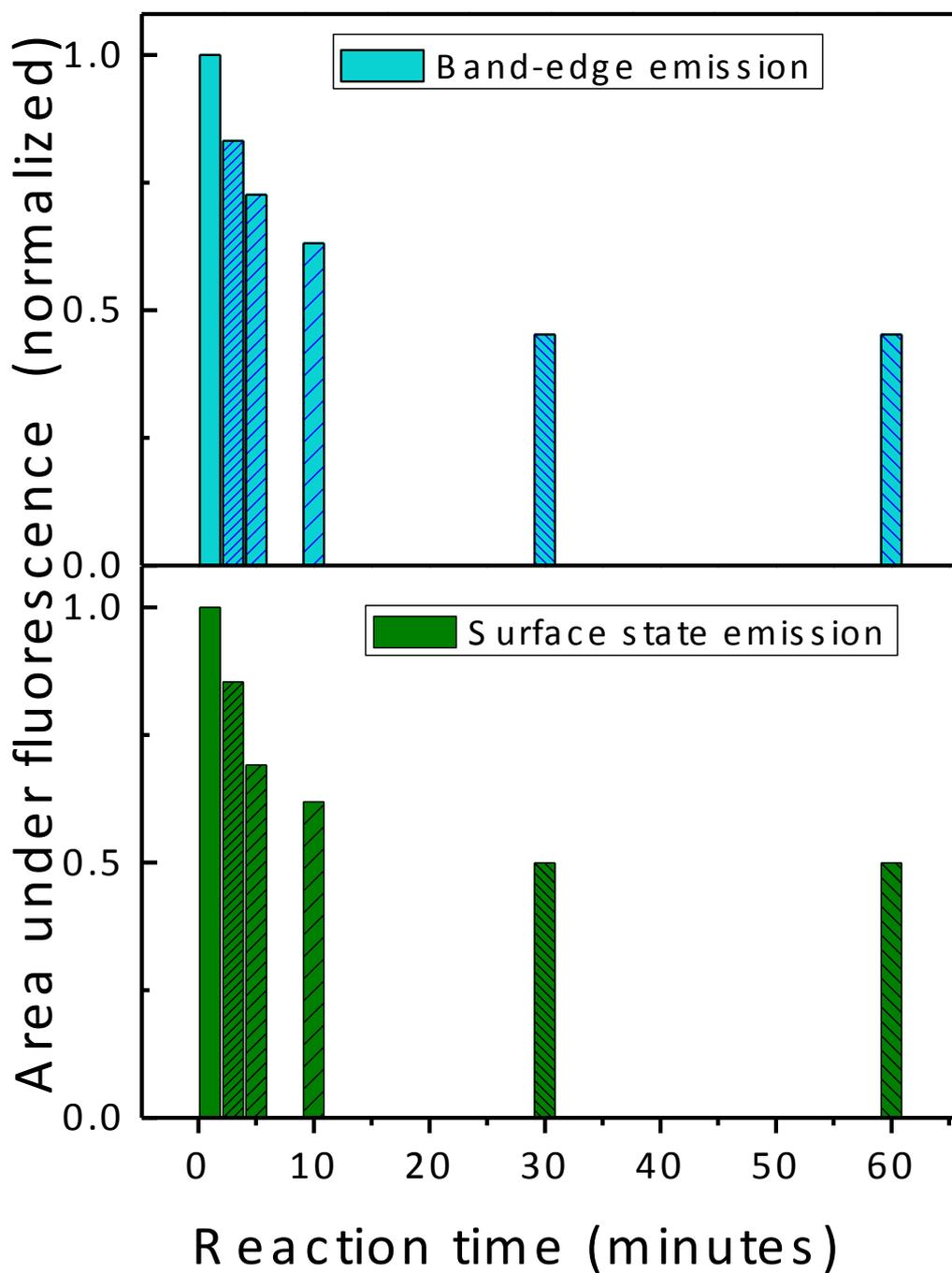


Figure S3. Area under the band edge (high energy) and surface state (low energy) emission spectral bands, for nano-tetrapods isolated from the reaction mixtures at different times. The emission spectra have been resolved into two gaussian components and the area under each has been calculated.

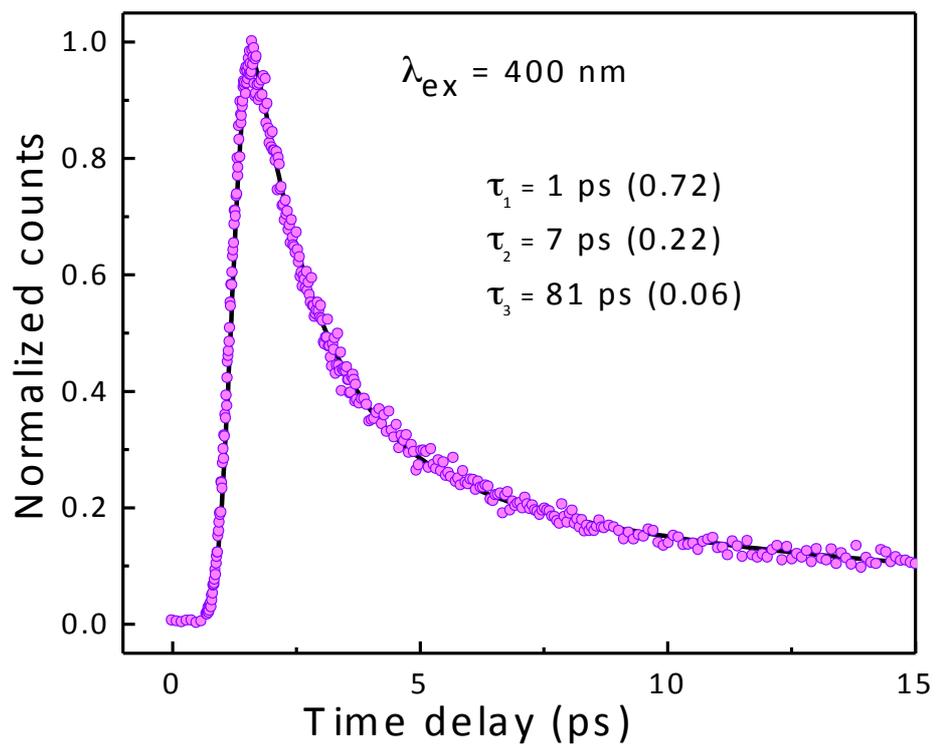


Figure S4. PL decay of CdSe nano-tetrapods where the experimental data is fitted to get the ultrafast components involved in the fluorescence emission. $\lambda_{\text{ex}} = 400 \text{ nm}$

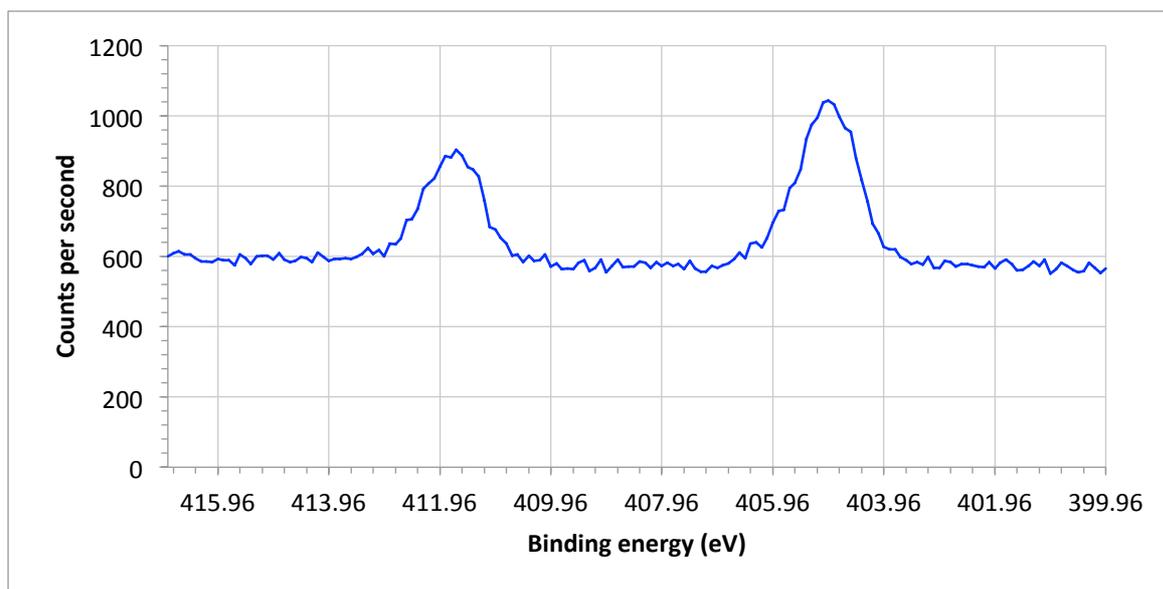


Figure S5. XPS depicts the presence of Cd (3d) in the surface of CdSe nano-tetrapods

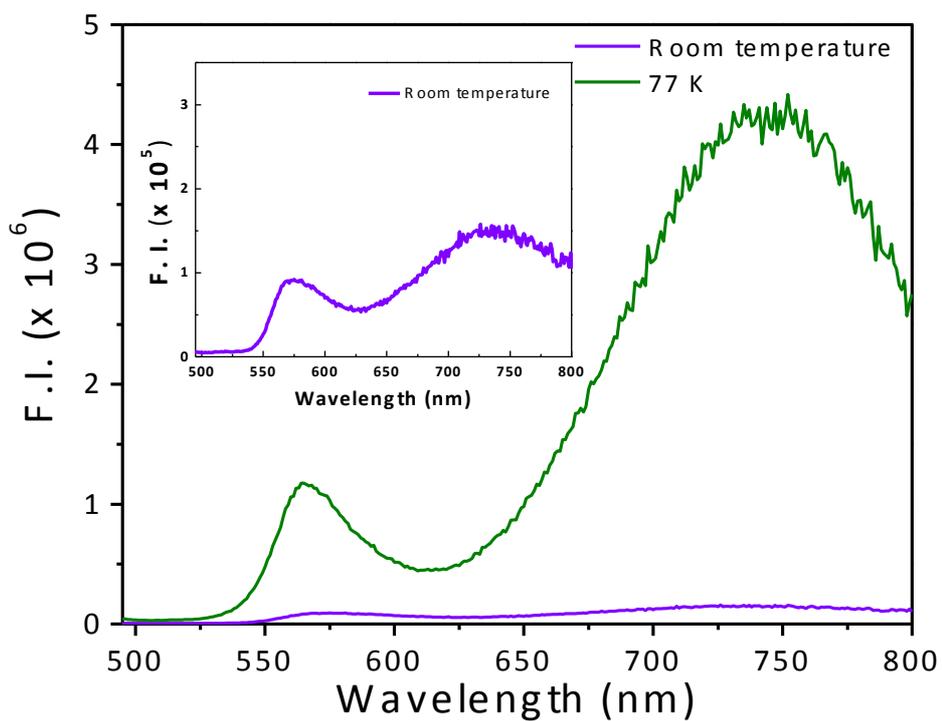


Figure S6. Un-normalized PL spectra of CdSe nano-tetrapods (30 min aliquot) in 3 methyl pentane (3MP) at room temperature and 77 K. Here enhancement of PL is also shown for band edge emission along with comparatively more enhanced surface state emission at 77 K.