Supporting Information For

Low Temperature Synthesis of Magic-Sized CdSe Nanoclusters: Influence of Ligands on Nanocluster Growth and Photophysical Properties

John C. Newton,^{\$, ‡} Karthik Ramasamy,^{\$,‡,†} Manik Mandal,[§] Gayatri K. Joshi,[§] Amar

Kumbhar,[#] and Rajesh Sardar^{\$,*}

 ^{\$}Department of Chemistry & Chemical Biology, Indiana University Purdue University Indianapolis, 402 N. Blackford Street, Indianapolis, IN 46202, United States.
[§]Department of Chemistry, Lehigh University, Seeley Mudd Building, 6 East Packer Avenue, Bethlehem, PA 18015, United States. [#] Chapel Hill Analytical and Nanofabrication Laboratory, University of North Carolina, Chapel Hill, NC 27599, United States. [‡]These authors contributed equally.

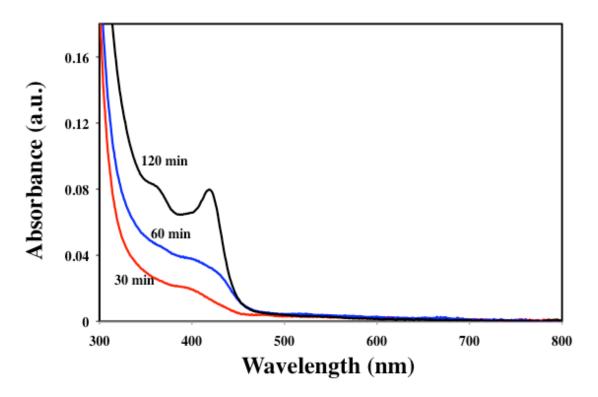
E-mail: rsardar@iupui.edu

-Table of Contents-

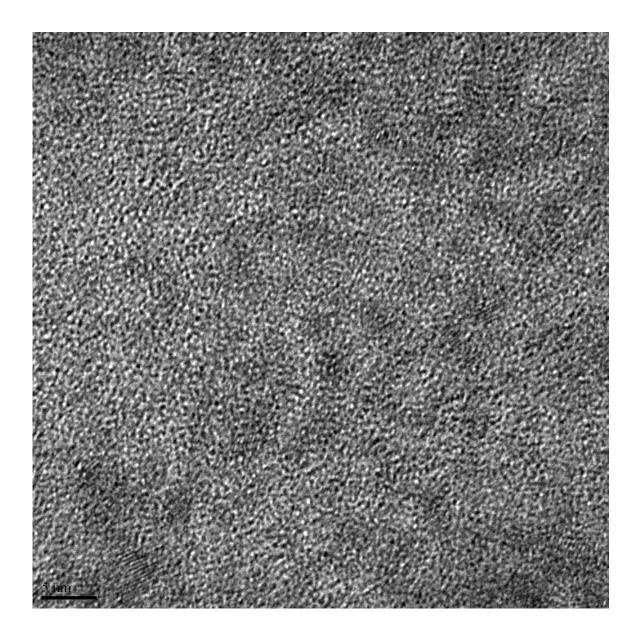
- **SI-Figure 1.** UV-visible absorption spectra of magic-sized, CdSe NC formation during the early stages of synthesis.
- **SI-Figure 2.** High-resolution TEM (HRTEM) image of TOPO-capped CdSe NCs. The diameter of the NC was determined to be 1.8 nm. The scale bar is 5 nm.
- **SI-Figure 3.** Energy dispersive X-ray spectrum of TOPO_capped CdSe NCs. The atomic ratio between Cd and Se was found to be 1.1:1.0.
- **SI-Figure 4.** UV-visible absorption spectra of CdSe NCs at different points of synthesis at 85 ^oC. The blue and black lines represent the spectrum of the sample taken two and 10 hours after TOPSe injection, respectively.
- **SI-Figure 5.** ³¹P{¹H} NMR spectra of different purity of TOPO samples collected in d_{6^-} acetone.
- **SI-Figure 6.** ³¹P{¹H} NMR spectra of TOPSe samples collected in d_8 -toluene.
- SI-Figure 7. (A) UV-visible absorption spectra of CdSe NCs at different points of synthesis using 90% TOPO and 97% TOPSe. (B) UV-visible absorption

spectra of CdSe NCs at different points of synthesis using recrystallized TOPO and vacuum distilled TOPSe.

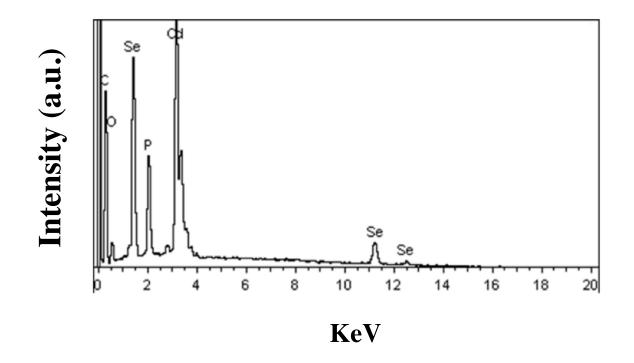
- **SI-Figure 8.** Powder XRD of OA-capped CdSe NCs, synthesized at 70 ^oC. The low angle peak positions are 5.0 and 7.1^o.
- SI-Figure 9. TEM image of LA-stabilized CdSe NCs. The scale bar is 20 nm.
- SI-Figure 10. Absorption (red) and emission (blue) spectra of TOA-capped CdSe NCs.



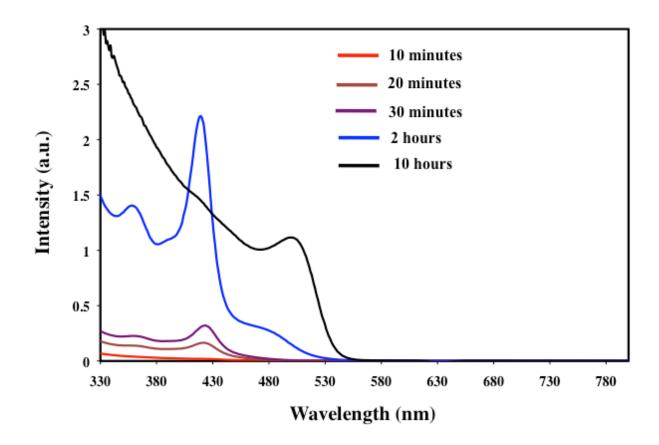
SI-Figure 1. UV-visible absorption spectra of magic-sized, CdSe NC formation during the early stages of synthesis.



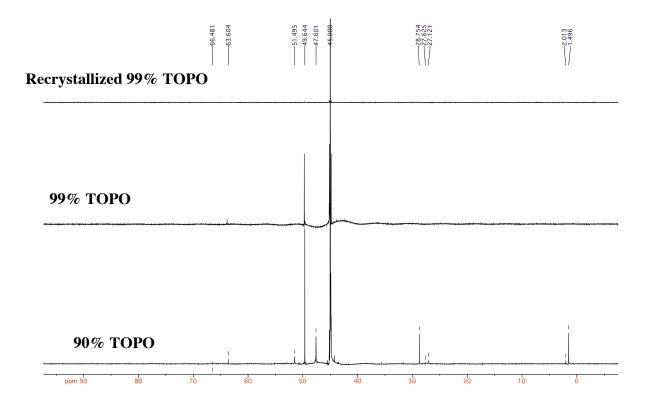
SI-Figure 2. High-resolution TEM (HRTEM) image of TOPO-capped CdSe NCs. The diameter of the NC was determined to be 1.8 nm. The scale bar is 5 nm.



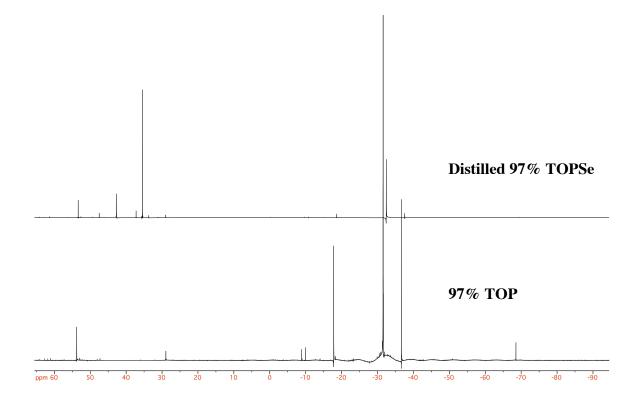
SI-Figure 3. Energy dispersive X-ray spectrum of TOPO-capped CdSe NCs. The atomic ratio between Cd and Se was found to be 1.1:1.0.



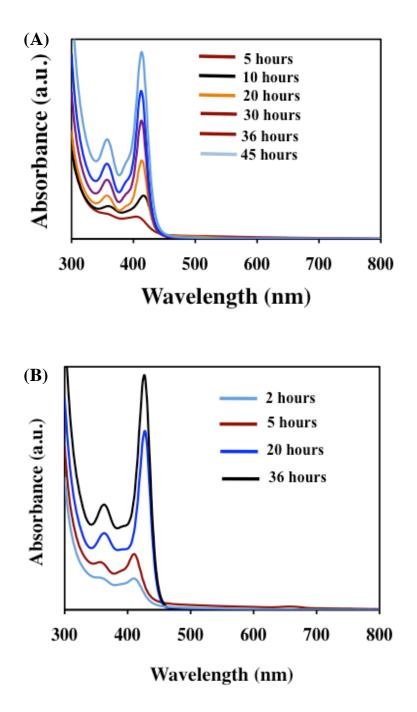
SI-Figure 4. UV-visible absorption spectra of CdSe NCs at different points of synthesis at 85 °C. The spectra of the sample were taken after TOPSe injection.



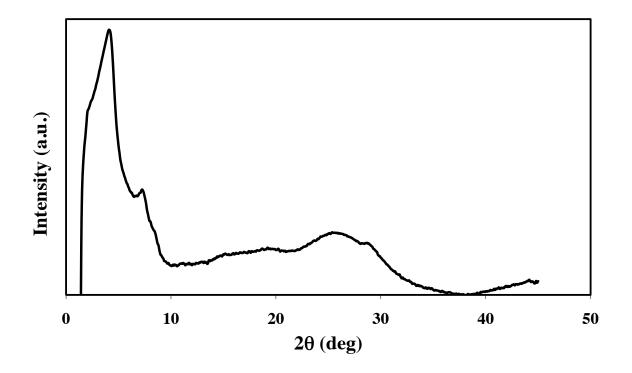
SI-Figure 5.³¹P{¹H} NMR spectra of different purity TOPO samples collected in $d_{6^{-}}$ acetone.



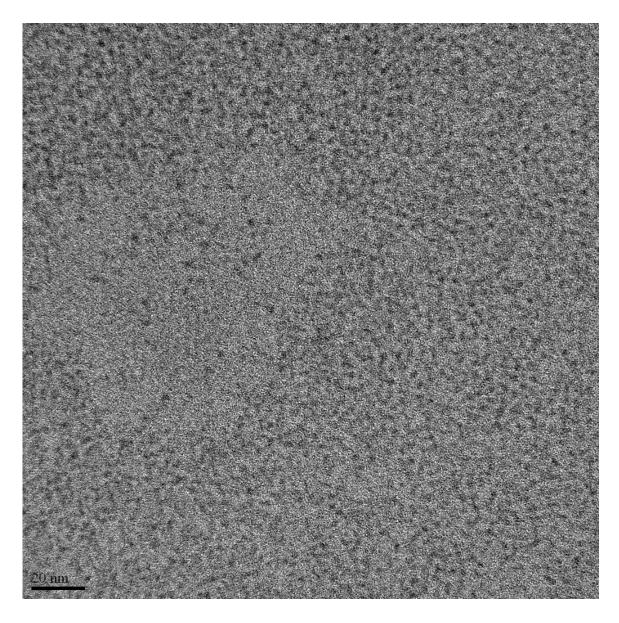
SI-Figure 6. ³¹P{¹H} NMR spectra of TOPSe and TOP samples collected in d_8 -toluene.



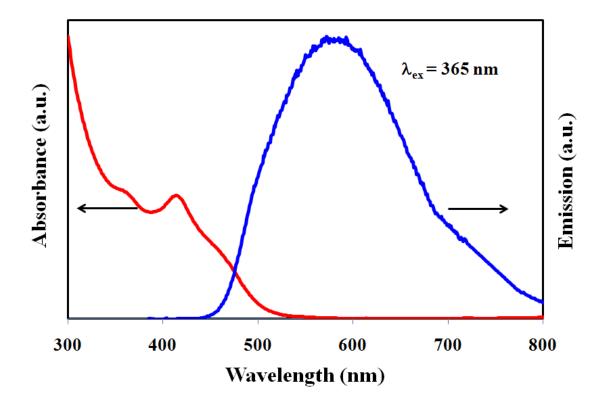
SI-Figure 7. (A) UV-visible absorption spectra of CdSe NCs at different points of synthesis using 90% TOPO and 97% TOPSe. (B) UV-visible absorption spectra of CdSe NCs at different points of synthesis using recrystallized TOPO and vacuum distilled TOPSe.



SI-Figure 8. Powder XRD of OA-capped CdSe NCs synthesized at 70 $^{\circ}$ C. The low angle peak positions are at 5.0 and 7.1 $^{\circ}$.



SI-Figure 9. TEM image of LA-stabilized CdSe NCs. The scale bar is 20 nm.



SI-Figure 10. Absorption (red) and emission (blue) spectra of TOA-capped CdSe NCs.