Electronic Supplementary Material (ESI) for Nanoscale
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Supplementary Information

Multicolored Cd1-xZnxSe Quantum Dots with Type-I Core/Shell Structure: Single-Step Synthesis and Use as Light Emitting Diodes

Ying-Chih Pu and Yung-Jung Hsu*

Department of Materials Science and Engineering, National Chiao Tung University, Hsinchu, Taiwan 30010, Republic of China

*E-mail: yhsu@cc.nctu.edu.tw

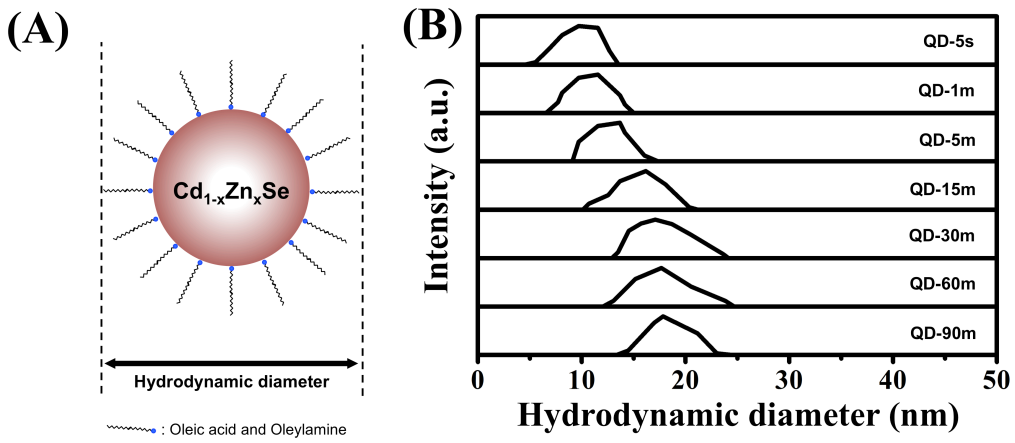

Fig. S1 (A) Schematic illustration of hydrodynamic diameter of QDs from DLS measurement. The measured size includes the core particle diameter and roughly two times the length of the attached ligand (OA, OLA). (B) DLS size distribution of $Cd_{1-x}Zn_xSe$ QDs at different reaction times. The determined hydrodynamic diameter was 9.8±1.9 nm for QD-5s, 10.7±2.0 nm for QD-1m, 12.7±1.7 nm for QD-5m, 15.3±2.3 nm for QD-15m, 17.2±2.3 nm for QD-30m, 17.6±2.6 nm for QD-60m and 18.2±1.8 nm for QD-90m.

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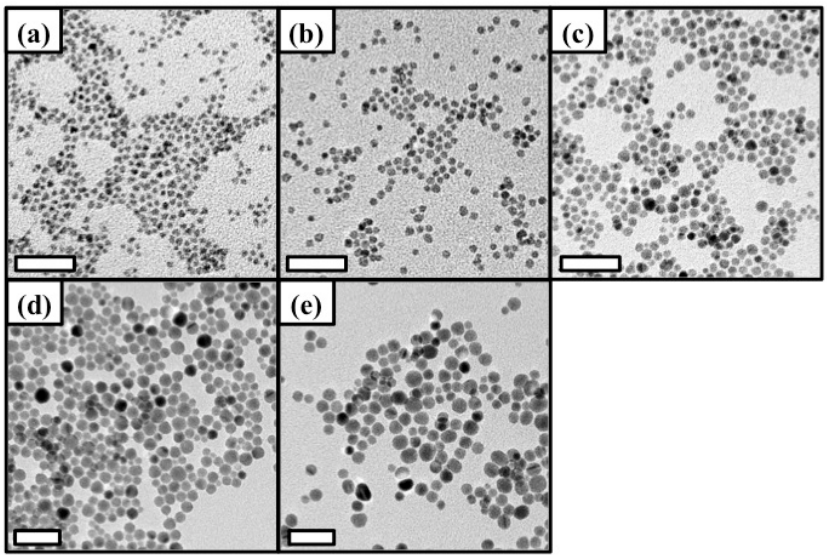

Fig. S2 TEM images of CdSe QDs at different reaction times: (a) 5 s, (b) 1 min, (c) 10 min, (d) 30 min and (e) 60 min. The scale bars are 50 nm.

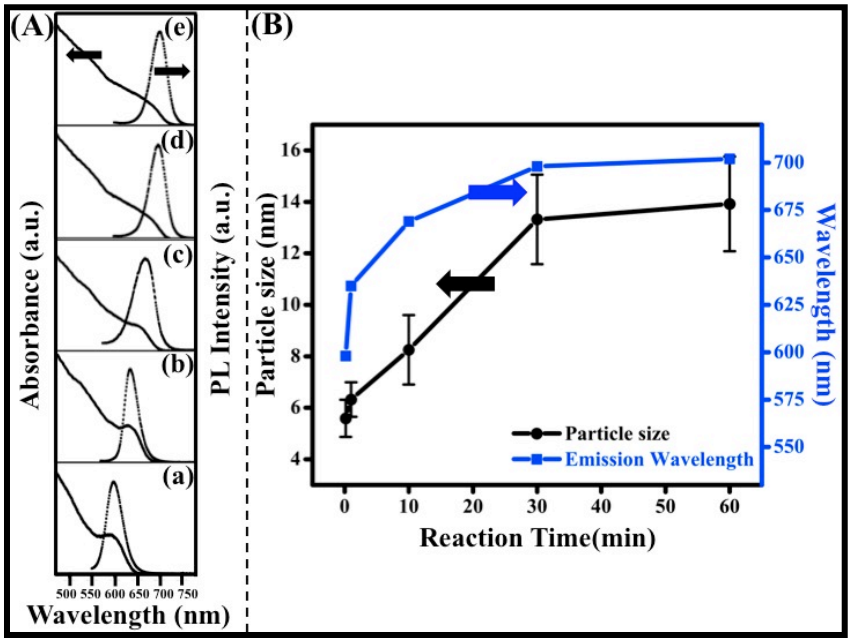

Fig. S3 (A) UV-visible absorption and PL (with λex = 365 nm) spectra for CdSe QDs at different reaction times: (a) 5 s, (b) 1 min, (c) 10 min, (d) 30 min and (e) 60 min. (B) The change in particle size and emission wavelength with reaction time.

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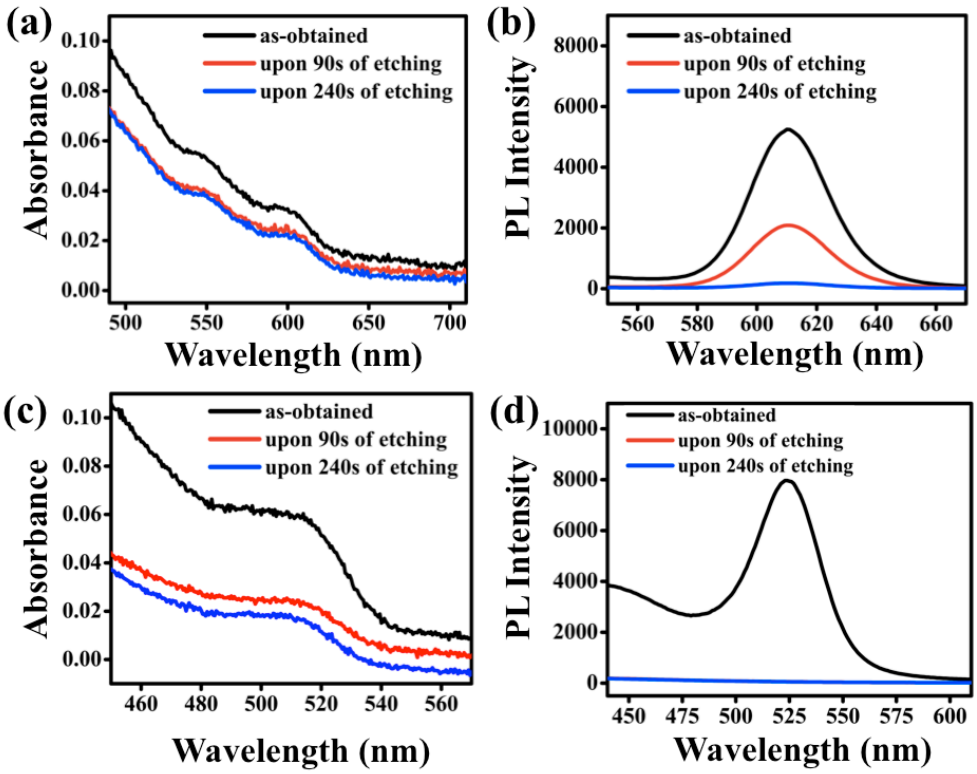

Fig. S4 (a) UV-visible absorption and (b) PL spectra of QD-1m during oxidative etching. (c) UV-visible absorption and (d) PL spectra of QD-60m during oxidative etching.

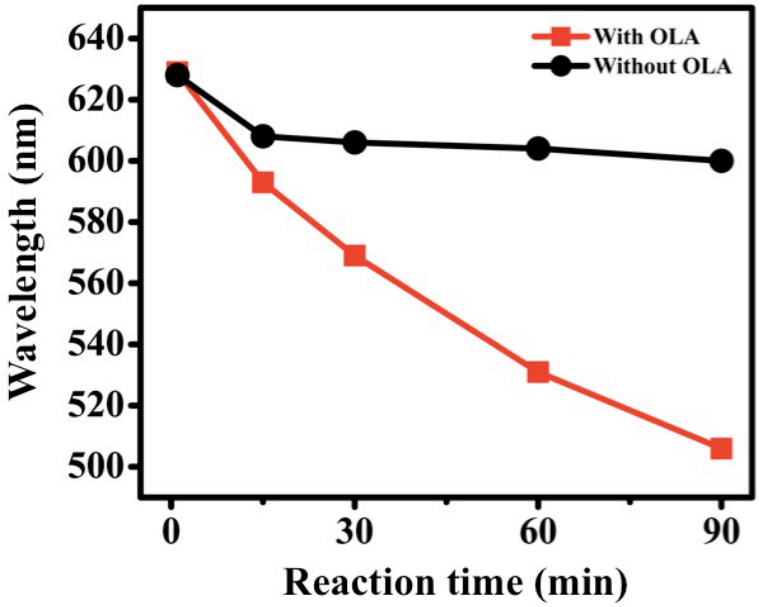

Fig. S5 The change in the emission wavelength for $Cd_{1-x}Zn_xSe$ QDs during the reaction period with and without the addition of OLA.

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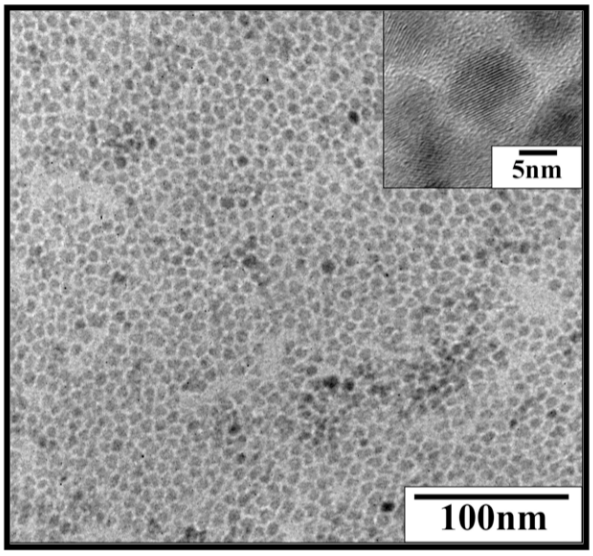

Fig. S6 Top-viewed TEM images for P3HT:QDs composite film. The QD concentration was optimized to form a single monolayer on the top of the P3HT film.

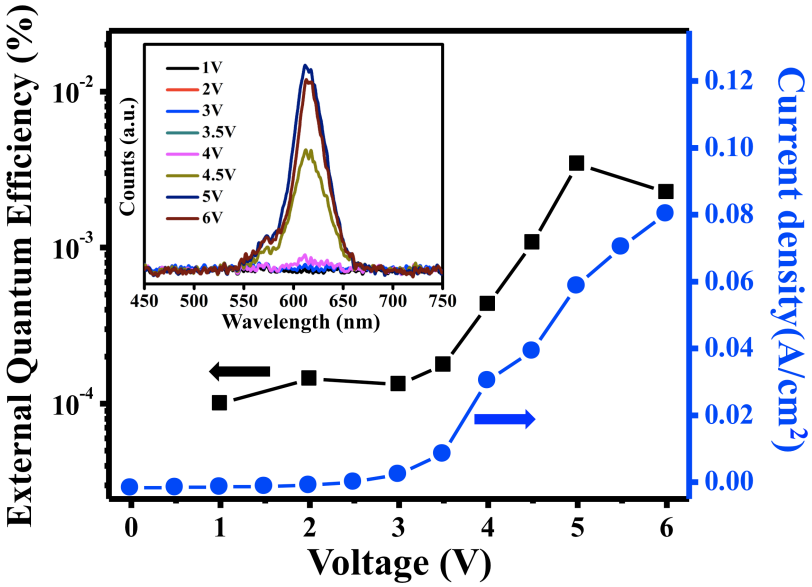

Fig. S7 Current-EQE-voltage plots for a red emissive QD-LED which used QD-1m as the active layer. Inset shows the evolution of EL spectra of the QD-LED with increasing voltage.