Electronic Supplementary Material (ESI) for Nanoscale.

Supporting Information

Efficient vacuum-free-processed quantum dot light-emitting diodes with printable liquid metal cathodes

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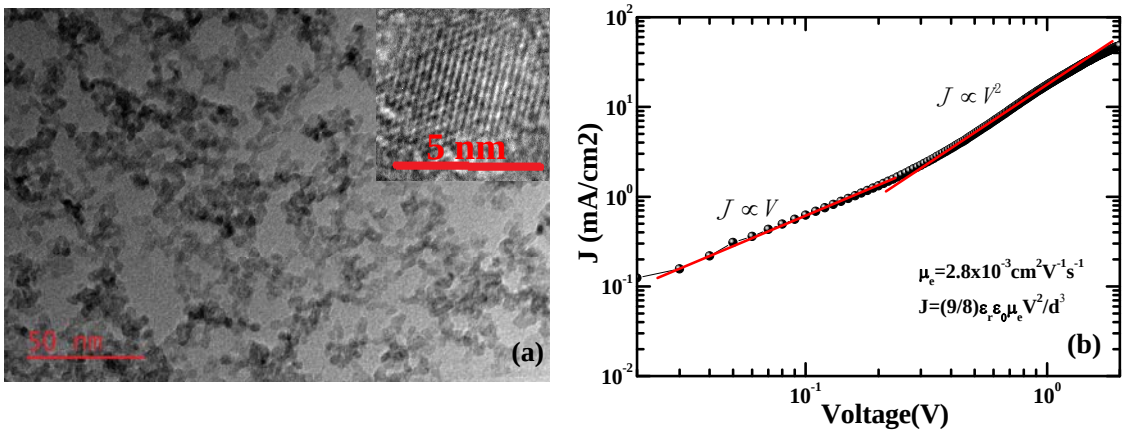

Figure S1. Characterization of ZnO nanoparticle：(a) TEM image of the ZnO nanoparticles (5 nm in diameter)；(b) Current density-voltage characteristics (J-V) of an electron-only device (ITO/ZnO/Al). The thickness of the ZnO layer is 400 nm. The electron mobility of the ZnO film is obtained by fitting space-charge-limited-current region, ($J \propto v^2$) with Child's law, $J=(9/8)\varepsilon_r\varepsilon_0\mu_e v^2/d^3$, where ε_0, ε_r, μ_e and d are the vacuum permittivity, relative permittivity, electron mobility and film thickness, respectively [1,2]. By assuming that $\varepsilon_r=4$, μ_e is determined to be 2.8×10^{-3} $cm^2V^{-1}s^{-1}$.

References

[1]. Qian, L.; Zheng, Y.; Xue, J.; Holloway, P. H. Stable and efficient quantum-dot light-emitting diodes based on solution-processed multilayer structures. *Nat. Photonics* **2011**, 5(9), 543-548.

[2]. Dai, X.; Zhang, Z.; Jin, Y.; Niu, Y.; Cao, H.; Liang, X.; Chen, L.; Wang, J.; Peng, X. Solution-processed, high-performance light-emitting diodes based on quantum dots. *Nature* **2014**, 515(7525), 96-99.

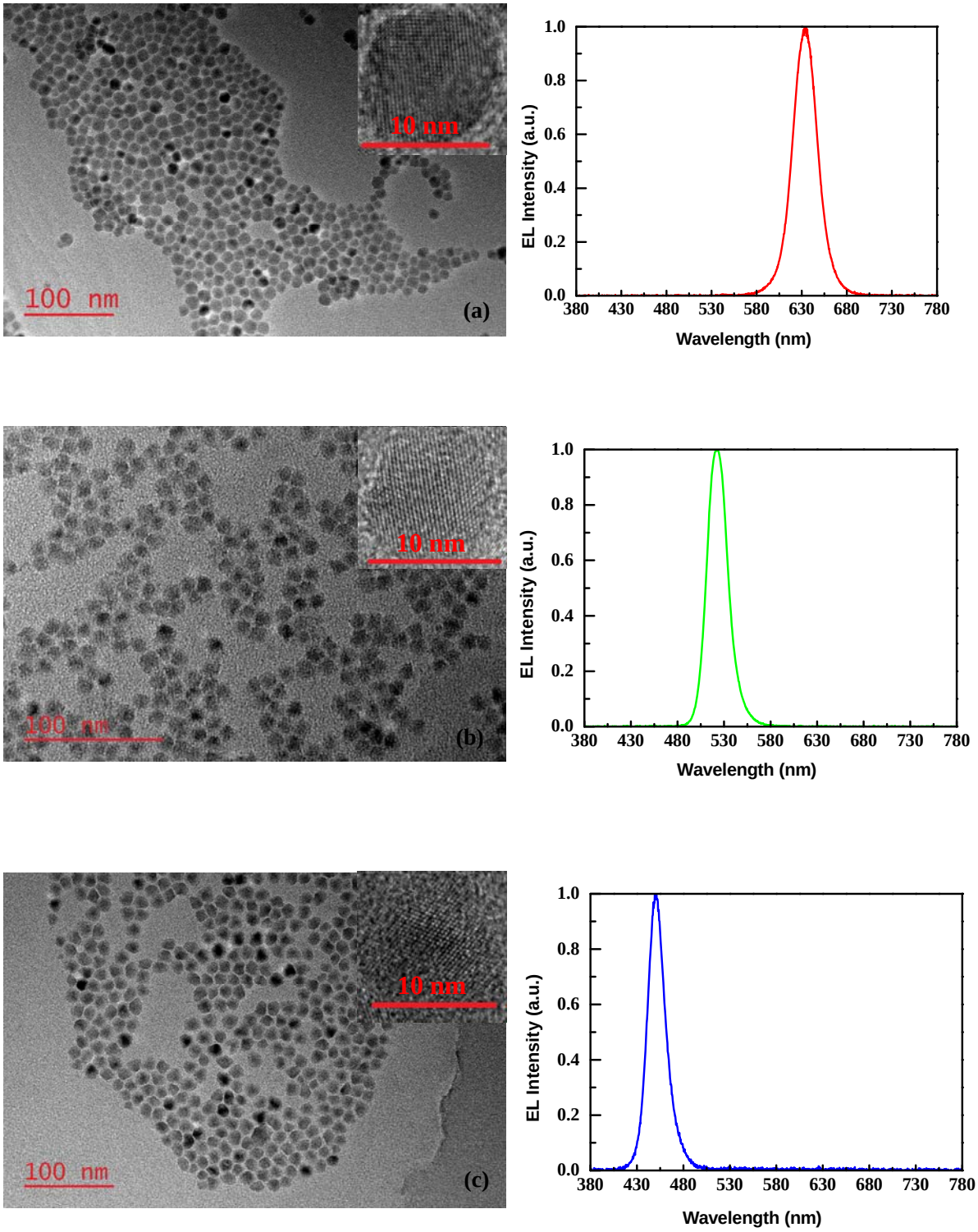

Figure S2. Characterization of quantum dots：The TEM images of the QDs were obtained using Tecnai F30 microscope at imaging center of Southern University of Science and Technology. (a) CdZnSe/CdS/ZnS red QDs, (b) CdZnSeS/ZnS green QDs, and (c) ZnCdS/ZnS blue QDs.