Phosphine-Free Synthesis of $\text{Zn}_{1-x}\text{Cd}_x\text{Se}$ / $\text{ZnSe} / \text{ZnSe}_x\text{S}_{1-x}$ /$\text{ZnS}$ Core/Multishell Structures with Bright and Stable Blue–Green Photoluminescence

Huaibin Shen$^{1,3}$, Changhua Zhou$^1$, ShaSha Xu$^1$, Cailan Yu$^2$, Hongzhe Wang$^1$, Xia Chen$^3$*, and Lin Song Li$^1$*

$^1$Key Laboratory for Special Functional Materials of the Ministry of Education, Henan University, Kaifeng, 475004, P. R. China

$^2$Key Laboratory of Photochemistry, Institute of Chemistry, Chinese Academy of Sciences, 100080, P. R. China

$^3$College of Life Science, Jilin University, Changchun, 130021, P. R. China

E-mail: lsli@henu.edu.cn, bbbbz@163.com.
Figure S1. TEM images of a series of ~3.5 nm Zn$_{1-x}$Cd$_x$Se nanocrystals, which correspond with Figure 1.
Figure S2. Powder XRD patterns of the Zn$_x$Cd$_{1-x}$Se samples with different molar ratios of Zn and Cd.
**Figure S3.** Evolution of the PL-peak position (black) and QYs (green) for core-shell nanocrystals.

**Figure S4.** A photo of purified powder Zn$_{1-x}$Cd$_x$Se/ZnSe/ZnSe$_{x}$S$_{1-x}$/ZnS core-shell nanocrystals sample (~ 10 g).
Figure S5. The corresponding size-distribution histograms of Figure 5.

Figure S6. High resolution TEM images of Figure 5.
Figure S7. EDX spectra of A) Zn$_{0.94}$Cd$_{0.06}$Se, B) Zn$_{0.94}$Cd$_{0.06}$Se/ZnSe, C) Zn$_{0.94}$Cd$_{0.06}$Se/ZnSe$_x$S$_{1-x}$, D) Zn$_{0.94}$Cd$_{0.06}$Se/ZnSe$_x$/Zn$_x$S$_{1-x}$/ZnS nanocrystals.

Figure S8. The corresponding size-distribution histogram of Figure 7.