Electronic Supplementary Information

Facile Synthesis of Composition-Gradient Cd$_{1-x}$Zn$_x$S Quantum Dots by Cation Exchange for Controlled Optical Properties

Dayeon Choi, Ji-Young Pyo, Yeonho Kim, and Du-Jeon Jang*
Department of Chemistry, Seoul National University, NS60, Seoul 151-742, Korea
E-mail: dijang@snu.ac.kr

Fig. S1  EDX spectra of (a) G–Cd$_{0.92}$Zn$_{0.08}$S, (b) G–Cd$_{0.82}$Zn$_{0.18}$S, (c) G–Cd$_{0.71}$Zn$_{0.29}$S, (d) G–Cd$_{0.49}$Zn$_{0.51}$S, and (e) G–Cd$_{0.13}$Zn$_{0.87}$S.
**Fig. S2** Variation of observed distances between adjacent (111) planes of G–Cd$_{1-x}$Zn$_x$S as a function of $x$; the standard distances between the (111) planes of cubic zinc-blende ZnS and CdS are indicated with crosses.

**Fig. S3** Maximum-normalized PL spectra of as-prepared G–Cd$_{1-x}$Zn$_x$S QDs dispersed in water, where $x$ is indicated inside. The samples were excited at 355 nm, and the inset shows the $\lambda_{\text{max}}$ of QDs versus $x$. 
Fig. S4  HRTEM images of (a) CdS, (b) G–Cd$_{0.71}$Zn$_{0.29}$S, (c) C–Cd$_{0.68}$Zn$_{0.32}$S, and (d) A–Cd$_{0.74}$Zn$_{0.26}$S.

Fig. S5  PL spectra of various indicated Cd$_{1-x}$Zn$_x$S QDs dispersed in water. The samples were excited at 355 nm. Note that the Cd$^{2+}$ concentration of the colloidal solution of G–Cd$_{0.71}$Zn$_{0.29}$S QDs has been calibrated to 5.0 mM as those of the other colloidal solutions.
Fig. S6 TGA(black) and DTA(red) curves of G–Cd$_{0.71}$Zn$_{0.29}$S QDs.