Supporting Information

Nanoparticle Loading Induced Morphological Transitions and Size Fractionation of Coassemblies from PS-b-PAA with Quantum Dots

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Figure S1. UV-vis absorption (black curve) and fluorescence (blue curve) spectra of oleic acid-capped CdSe/CdS core/shell QDs.
**Figure S2.** Changes in turbidity of the coassembly solution ($\omega = 0.44$) with the addition of water.

The critical water content (CWC) is 11.9 wt%.
Figure S3. TEM image of LCMs and bowl-shaped structures prepared by PS$_{48}$-b-PAA$_{67}$ with 4.1 nm oleic acid-capped Fe$_2$O$_3$ nanoparticles ($\omega = 0.5$).
Figure S4. Relationship between relative centrifugal forces (a) or pore sizes of membranes (b) with the sizes of fractions.
Figure S5. Fluorescence spectra of stock solution at $\omega = 0.44$ (black curve) and fraction A separated by centrifugation at a relative centrifugal force of $1467 \times g$ for 10 min (red curve), the peak at 514 nm belongs to the fluorescence of coassemblies. QDs exhibited a decrease in fluorescence emission intensity after coassembly with $\text{PS}_{48-b}\text{-PAA}_{67}$. In our case, the long PAA block could replace the original OA ligands and bind to the surface of QDs through coordination, as consequence QDs were exposed to water directly. The changes of solvent and surface chemistry of QDs may lead to the decrease in fluorescence emission intensity.$^{1,2}$
Figure S6. Influence of centrifugations on the hydrodynamic diameters of coassemblies. The sizes did not change after centrifuged at $1467 \times g$ for 30 min and succedent $5867 \times g$ for 60 min. However, the size became smaller after further centrifuged at $20627 \times g$ for 60 min. This phenomenon may be due to the morphological transition from porous spheres to bowl-shaped structures. The high centrifugal force may make the bubbles which were located close to the edge of porous spheres break through the thinner surface and formed bowl-shaped structure. Meanwhile, the trapped water within the bubbles was released, leading to the mass loss of coassemblies. Therefore, the hydrodynamic diameter decreased after centrifuged at high centrifugal force.

REFERENCES
