Supporting Information

Preparation of polydopamine hollow capsule in miscible tetrahydrofuran/buffer mixture

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**Figure S1.** A proposed polydopamine self-polymerization mechanism.¹
Figure S2. The TEM images of dopamine particles via 8 days oxidation and self-polymerization in Tetrahydrofuran/Tris buffer mixture (φ=0.7). The dopamine concentration in the mixture is (a) 0.1, (b) 0.5, (c) 1.0 mg/ml; (d) Thickness values of the PDA capsule shell formed in the mixture at different dopamine concentration (0.1, 0.5, 1.0 mg/ml) respectively. Note that the reaction solutions were directly used for TEM without any purification.

Figure S3. The SEM image of PDA nanocapsules (φ = 0.7) kept in the THF/buffer mixture (φ=0.7) for 5 month at 4 °C. Note that the reaction solutions were directly used for SEM observation without any purification.
**Figure S4.** Dopamine self-polymerization dynamics in the THF/tris buffer mixture at (a) $\phi \approx 0$, (b) $\phi \approx 0.2$ and (c) $\phi \approx 0.5$.

**Figure S5.** The TEM image of dopamine particles via 7 days oxidation and self-polymerization in THF/Phosphate Buffer mixture at $\phi = 0.7$. Note that the reaction solution was directly used for TEM observation without any purification.
Figure S6. (a) The TEM image of PDA nanoparticles via 7 days oxidation and self-polymerization in DMSO/Tris buffer mixture (pH=0.7); (b) The size distribution of PDA nanoparticles based on the statistical analyses of 200 particles. Note that the reaction solution was directly used for TEM observation without any purification.