

Electronic supplementary information (ESI):

***In situ* functionalization of hollow mesoporous hydroxyapatite with thermal-responsive on-off gates in supercritical CO₂**

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Figure Captions:

Fig. S1 Preparation of pH-/thermal- dual responsive aliphatic PUA.

Fig. S2 SEM micrographs of CaCO₃ (A1) and HAP microparticles (B1), corresponding EDX spectra of CaCO₃ (A2) and HAP microparticles (B2).

Fig. S3 SEM image of PUA-g-H-HAP microparticles (A) and corresponding diameter dispersity bar diagram (B).

Fig. S4 XRD curves of H-HAP microparticles and thermal-responsive PUA-g-H-HAP microparticles.

Fig. S5 Plots of $\ln(M_t/M_\infty)$ versus $\ln t$ for H-HAP and PUA-g-H-HAP microparticles at pH 7.4 and 37 °C (A), and plots of $\ln(M_t/M_\infty)$ versus $\ln t$ for PUA-g-H-HAP microparticles at different pH values and temperatures (B).

Table S1 Parameters n and R^2 determined by Eq. (1) for the DOX release of samples at different release conditions

Microparticles	Release condition	k	n	R^2
H-HAP	pH 7.4, 37 °C	0.234	0.272	0.946
PUA-g-H-HAP	pH 7.4, 37 °C	0.092	0.349	0.921
PUA-g-H-HAP	pH 2.1, 37 °C	0.271	0.481	0.974
PUA-g-H-HAP	pH 7.4, 55 °C	0.292	0.240	0.980

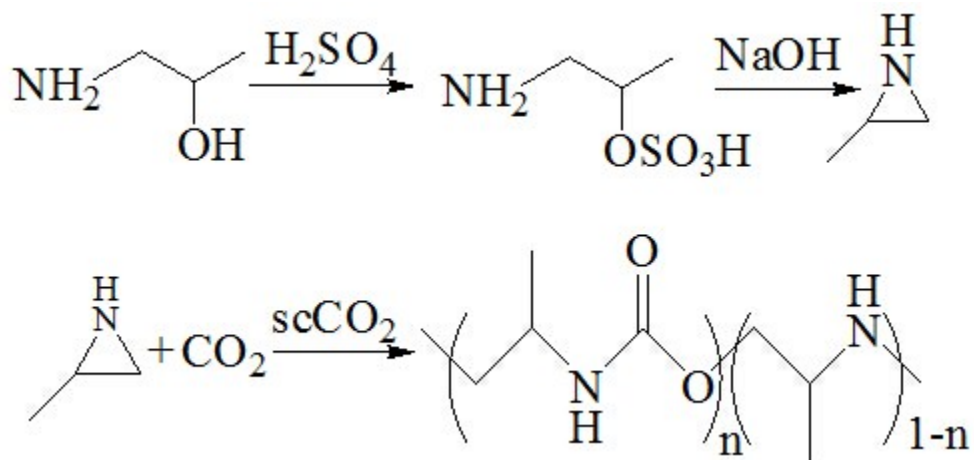


Fig. S1

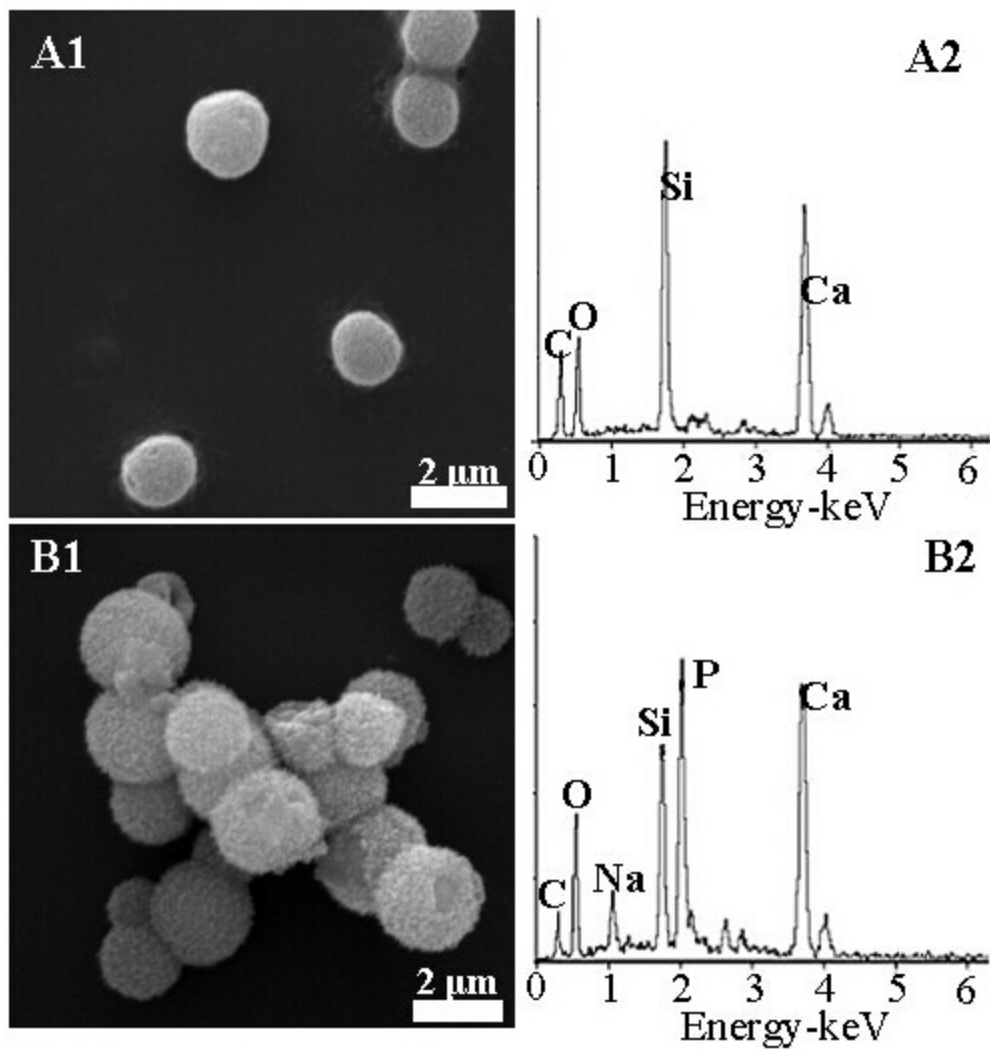


Fig. S2

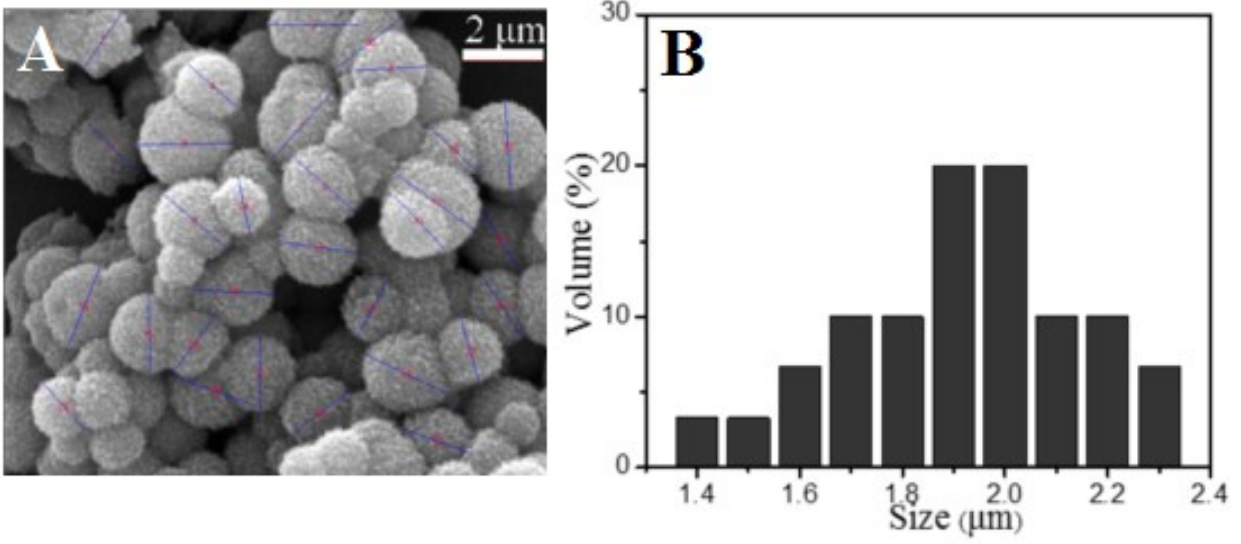


Fig. S3

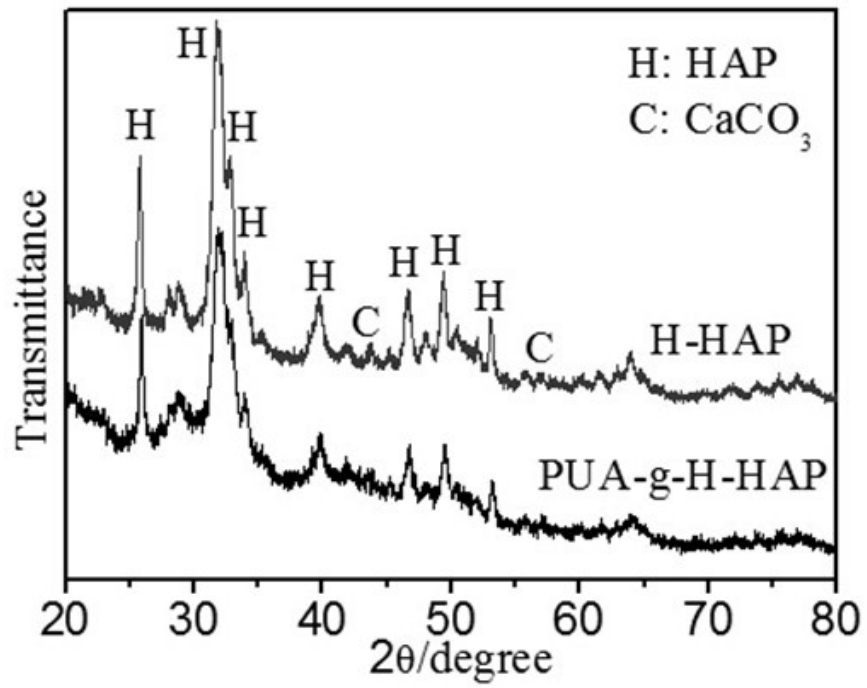


Fig. S4

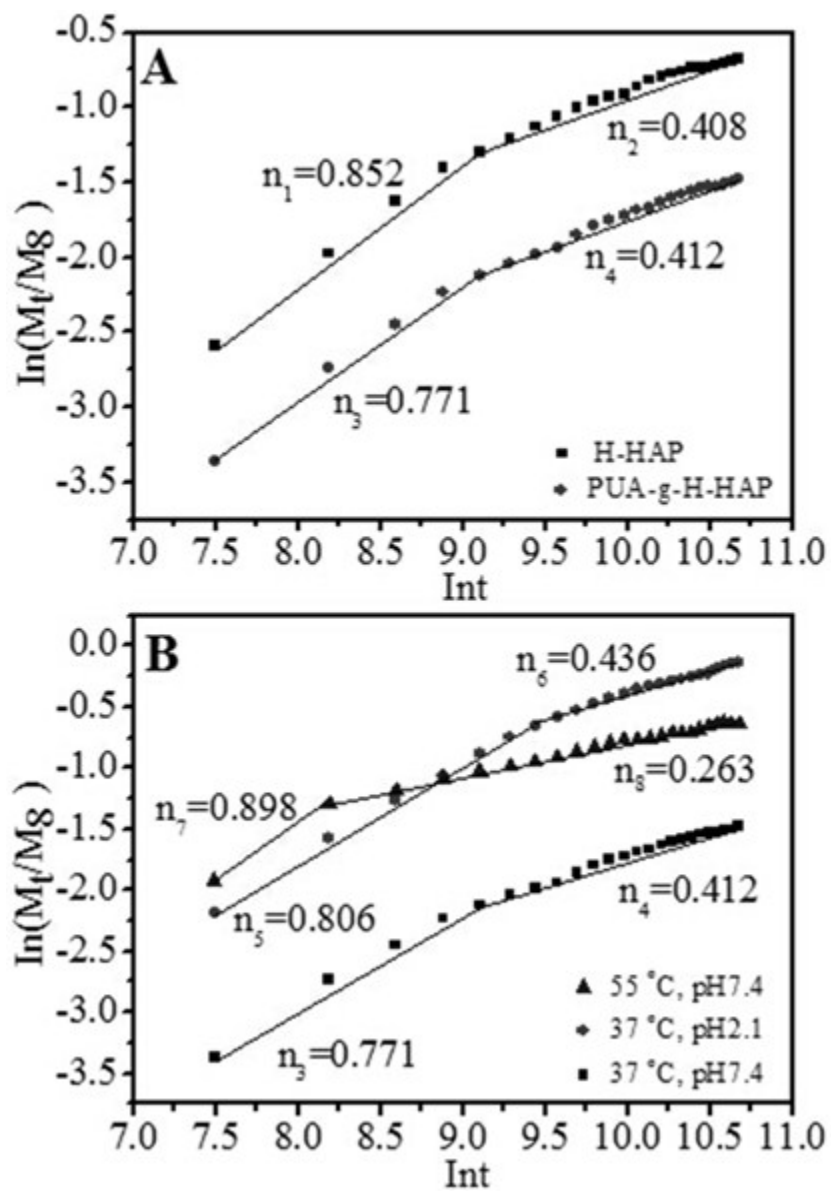


Fig. S5