Supporting information

Core-shell structure design of hollow mesoporous silica nanospheres for dual pH/thermo-sensitivity

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Figure S1. Powder XRD patterns of HMS (preparation conditions: m(CTAB):m(TEOS):m(PS) = 0.5:1:1).

Figure S2. SEM images of HMS obtained from 145 nm (a) and 212 nm (b) PS template microsphere, respectively. Preparation conditions: m(CTAB):m(TEOS):m(PS) = 0.5:1:1. (c) SEM images of HMS obtained from 212 nm PS template microsphere. Preparation conditions: m(CTAB):m(TEOS):m(PS) = 0.5:1.5:1.

Table S1. Structure properties of HMS prepared with various ratio of CTAB and TEOS

<table>
<thead>
<tr>
<th>m(CTAB):m(TEOS)</th>
<th>S_{BET} (m^2 g^{-1})</th>
<th>V_{tot} (cm^3 g^{-1})</th>
<th>Pore size (nm)</th>
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<tbody>
<tr>
<td></td>
<td>0</td>
<td>144</td>
<td>0.072</td>
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<tr>
<td></td>
<td>0.2</td>
<td>715</td>
<td>0.901</td>
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<td>2.2</td>
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Scheme S1. The synthesis mechanism of DMA.

Figure S3. FT-IR spectra of DMA.

Figure S4. $^1$H NMR spectra of DMA in DMSO-$d_6$. 
**Figure S5.** $^{13}$C NMR spectra of DMA in DMSO-$d_6$.

**Figure S6.** The standard curve of DOX obtained from ultraviolet absorption at 480 nm in the concentration range of 0~10 µg ml$^{-1}$ (a) and 20~90 µg ml$^{-1}$ (b).

**Figure S7.** TGA curves of (a) DOX@HMS@P(NIPAM-co-DMA) and un-modified HMS (b) obtained from DOX/PBS of different concentrations.
Figure S8. Cumulative release of DOX from DOX@HMS.