

## Supporting information

$^1\text{H}$  NMR spectra and  $^{13}\text{C}$  NMR spectra of synthesized compounds

# Core-Shell Mesoporous Silica Nanosphere Used as $\text{Zn}^{2+}$ Ratiometric Fluorescent Sensor and Adsorbent

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Fig. S1  $^1\text{H}$  NMR spectra of compound 2

Fig. S2  $^{13}\text{C}$  NMR spectra of compound 2

Fig. S3  $^1\text{H}$  NMR spectra of compound 3

Fig. S4  $^{13}\text{C}$  NMR spectra of compound 3

Fig. S5  $^1\text{H}$  NMR spectra of compound Rhodamine 101-succinimide

Fig. S6  $^{13}\text{C}$  NMR spectra of compound Rhodamine 101-succinimide

Fig. S7 Fluorescence spectra of R-S-MSN ( $10^{-5}$  M) in EtOH-water solution (30 vol% EtOH) at different pH value (3-12) in the presence of  $10^{-4}$  M  $\text{Zn}^{2+}$ .

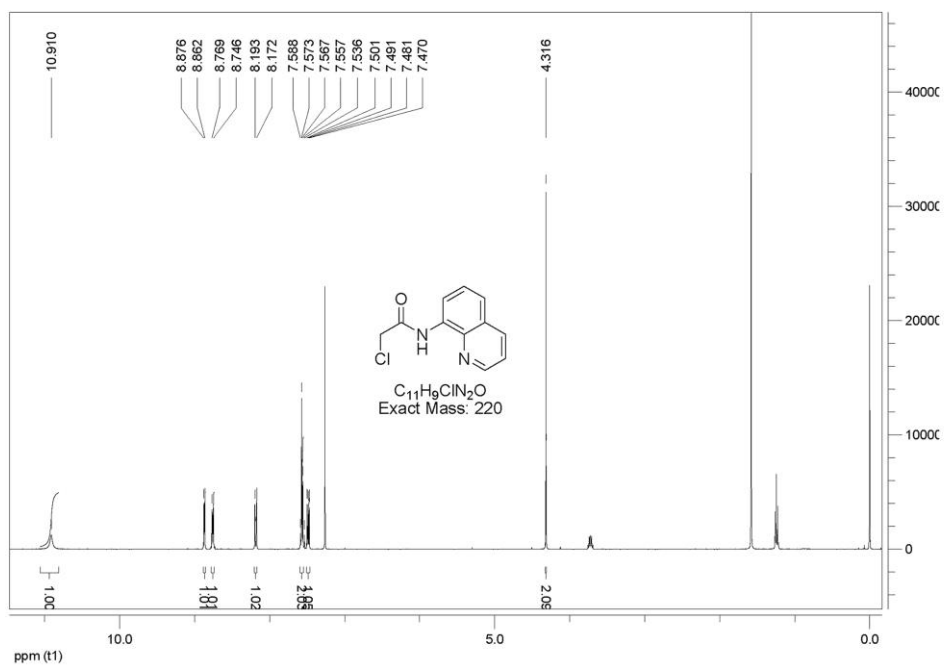


Fig. S1 <sup>1</sup>H NMR spectra of compound 2

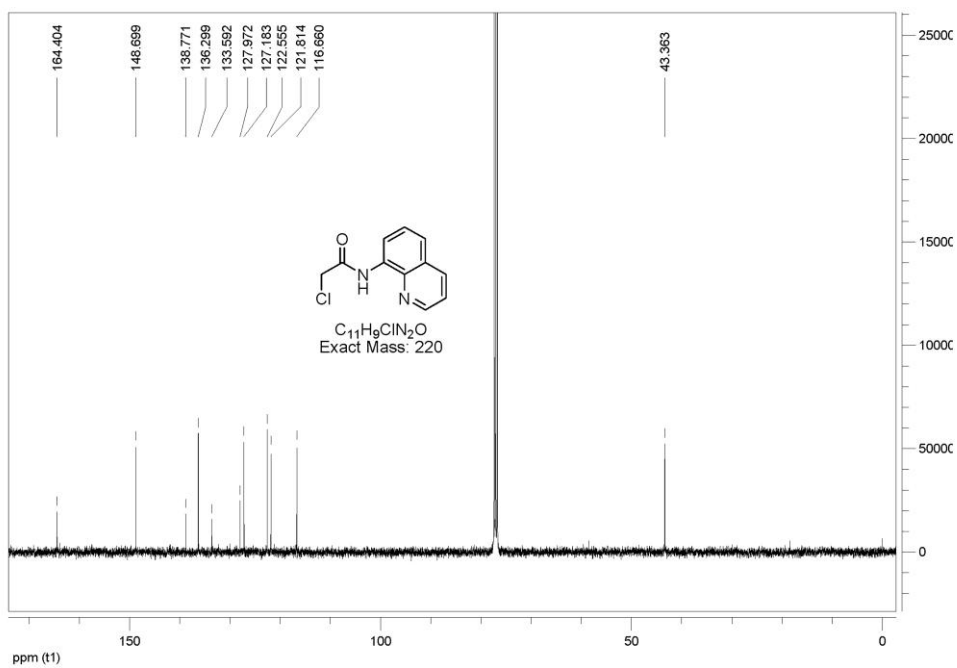


Fig. S2 <sup>13</sup>C NMR spectra of compound 2



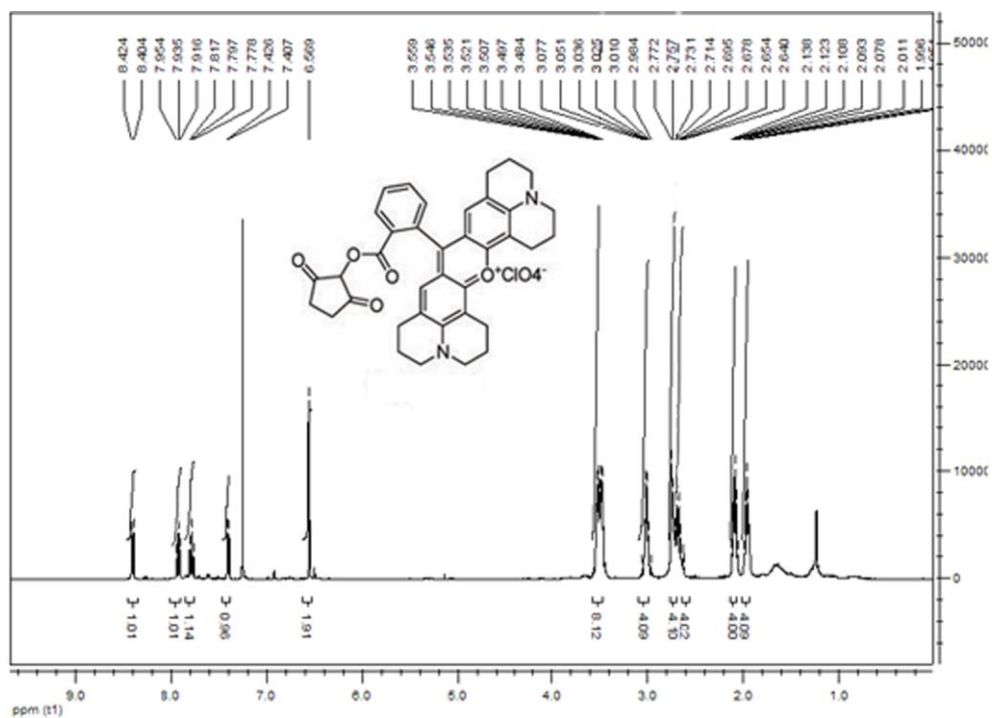


Fig. S5 <sup>1</sup>H NMR spectra of Rhodamine 101-succinimide

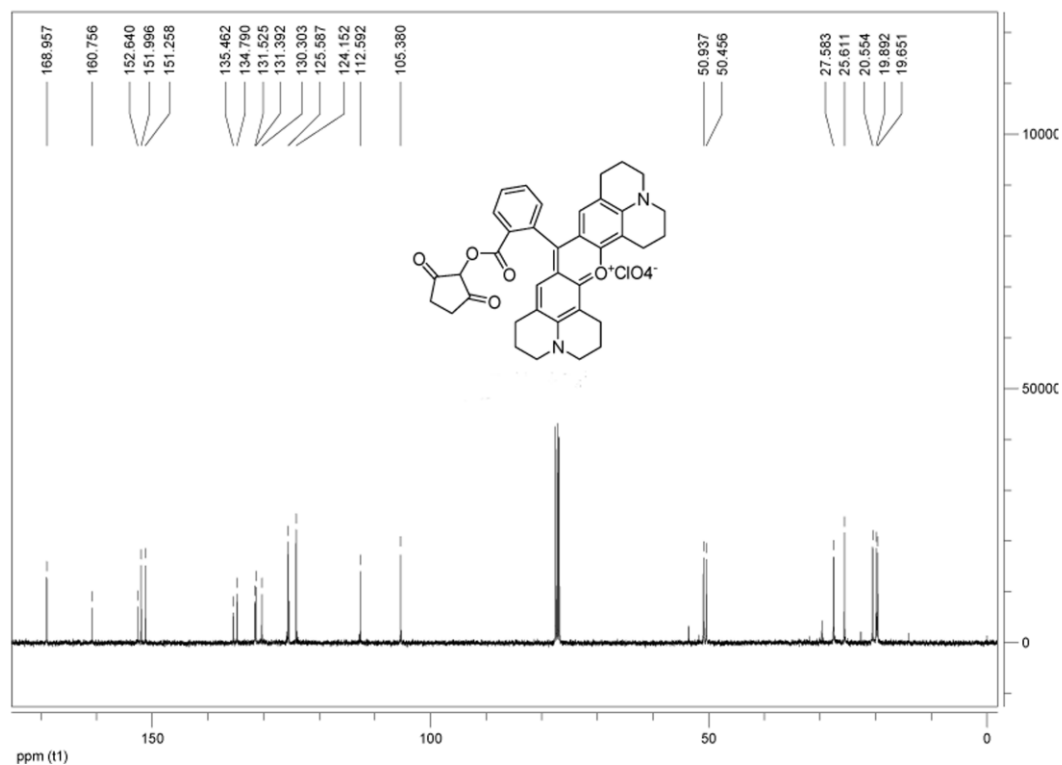


Fig. S6 <sup>13</sup>C NMR spectra of Rhodamine 101-succinimide

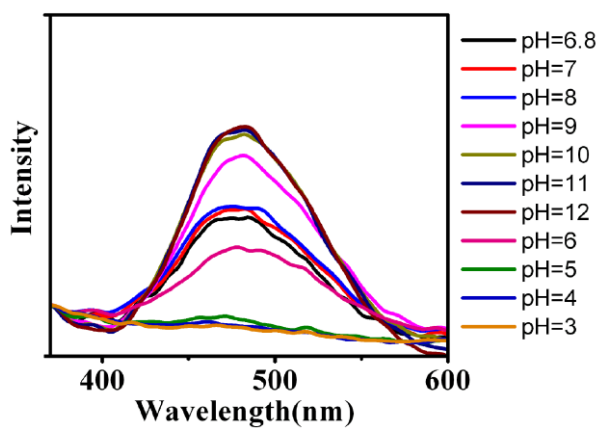


Fig. S7 Fluorescence spectra of R-S-MSN ( $10^{-5}$  M) in EtOH-water solution (30 vol% EtOH) at different pH value (3-12) in the presence of  $10^{-4}$  M  $Zn^{2+}$ .