

## SUPPORTING INFORMATION

### **Aggregation-Induced Emission Star Polymer with pH and Metal Ion Responsive Fluorescence**

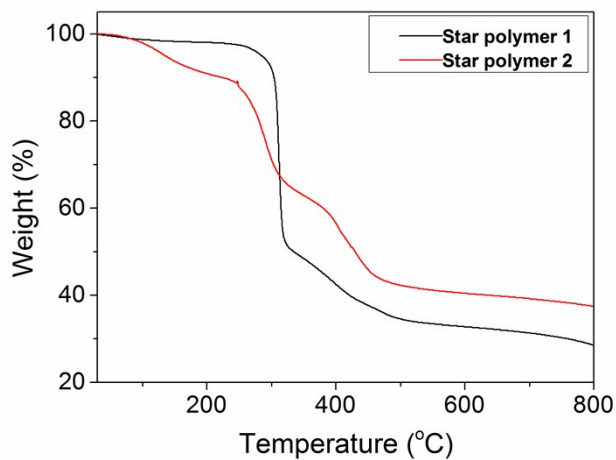
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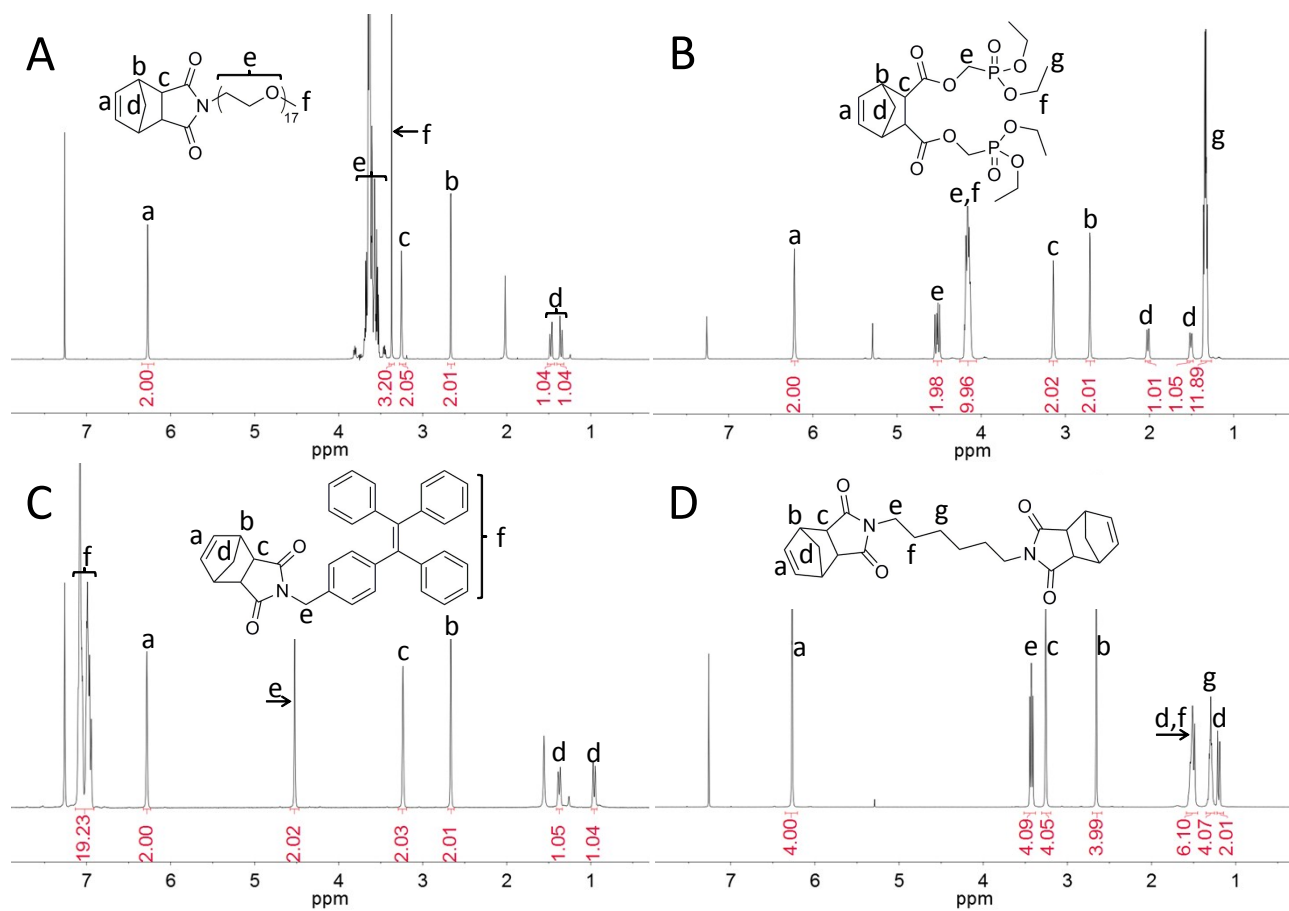
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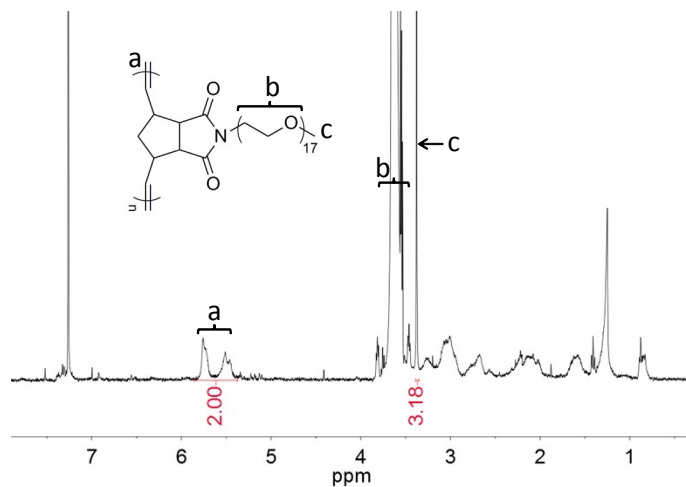
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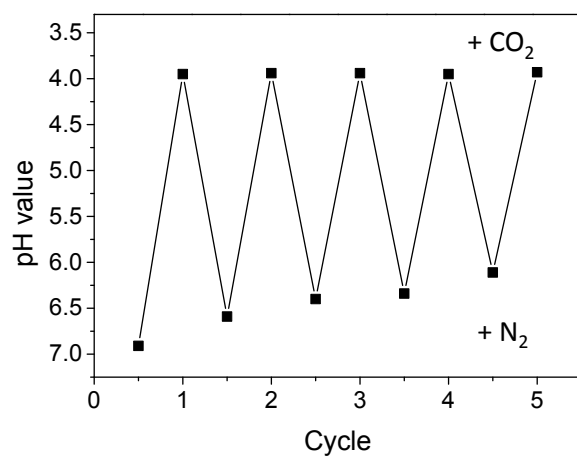
**Figure S1.** TGA curves of **star polymer 1** (black) and **star polymer 2** (red).



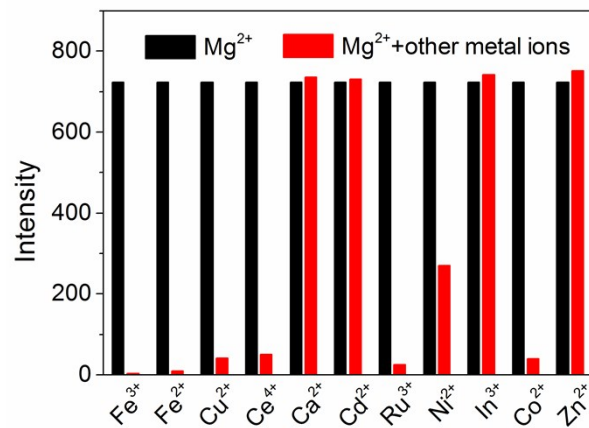
**Figure S2.**  $^1\text{H-NMR}$  spectra of (A) **M1**, (B) **M2**, (C) **M3** and (D) **bi-Nor** in  $\text{CDCl}_3$ .



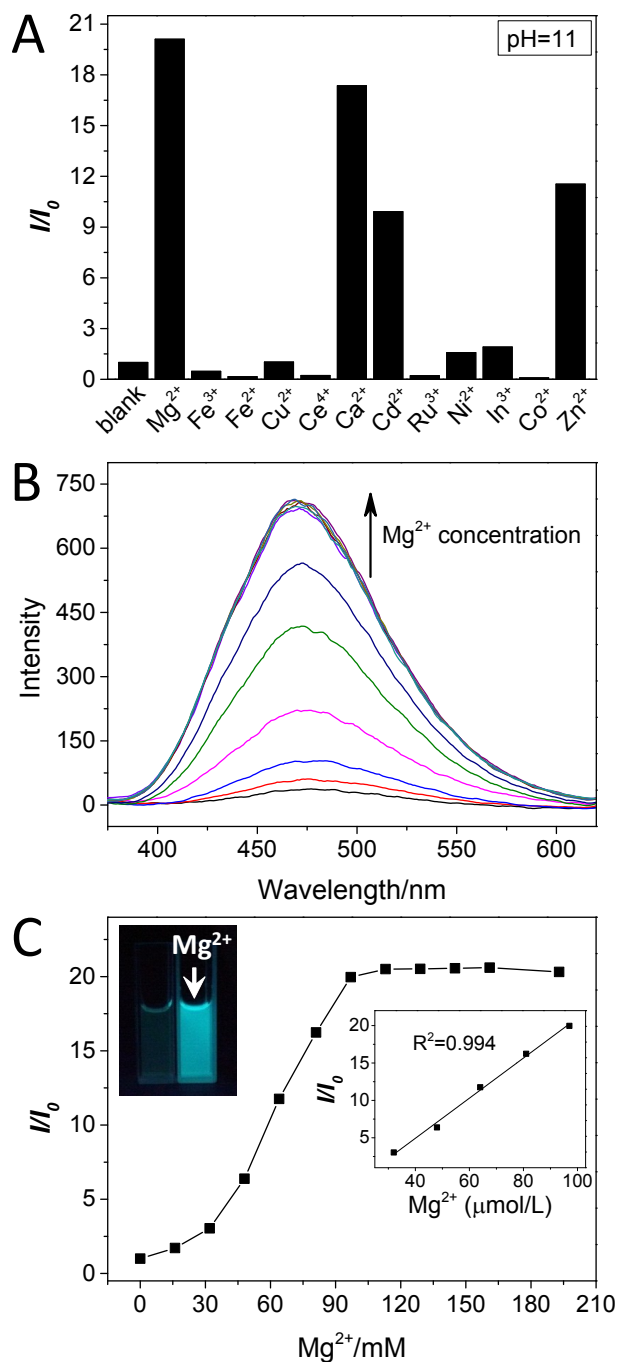
**Figure S3.**  $^1\text{H-NMR}$  spectrum of poly(**M1**)<sub>20</sub> polymerization solution without precipitation in  $\text{CDCl}_3$ .



**Figure S4.** Recycle test of pH value of **star polymer 2** aqueous solution (16 mg/L, 3 mL) by alternatively bubbling  $\text{CO}_2$  (3 min) and  $\text{N}_2$  (3 min).

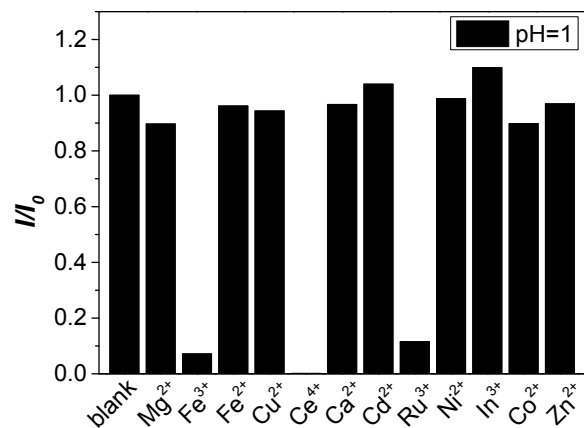


**Figure S5.** Fluorescence intensity of the aqueous solution of **star polymer 2** (16 mg/L, pH = 7) containing Mg<sup>+</sup> (193 μmol/L) in the presence of other metal ions of Fe<sup>3+</sup>, Fe<sup>2+</sup>, Cu<sup>2+</sup>, Ce<sup>4+</sup>, Ca<sup>2+</sup>, Cd<sup>2+</sup>, Ru<sup>3+</sup>, Ni<sup>2+</sup>, In<sup>3+</sup>, Co<sup>2+</sup>, and Zn<sup>2+</sup> (193 μmol/L).



**Figure S6.** (A) Fluorescence intensity ratio ( $I/I_0$ , 473 nm) of **star polymer 2** aqueous solution (16 mg/L, pH = 11) in the presence of metal ions  $Mg^{2+}$ ,  $Fe^{3+}$ ,  $Fe^{2+}$ ,  $Cu^{2+}$ ,  $Ce^{4+}$ ,  $Ca^{2+}$ ,  $Cd^{2+}$ ,  $Ru^{3+}$ ,  $Ni^{2+}$ ,  $In^{3+}$ ,  $Co^{2+}$  and  $Zn^{2+}$  (193  $\mu\text{mol/L}$ ), in which  $I_0$  was used as the fluorescence intensity of **star polymer 2** aqueous solution without metal ion (blank). (B) Fluorescence spectra of **star polymer 2** aqueous solution (16 mg/L, pH = 11) with different concentration of  $Mg^{2+}$ . (C) Fluorescence intensity ratio ( $I/I_0$ , 473 nm) of **star polymer 2** aqueous solution (16 mg/L, pH = 11) in the presence of  $Mg^{2+}$  with different concentration. The insert is the corresponding

fluorescence photograph of **star polymer 2** aqueous solution (0.9 mg/mL, pH = 11) without (left) and with (right)  $\text{Mg}^{2+}$  irradiated under UV of 365 nm.



**Figure S7.** Fluorescence intensity ratio ( $I/I_0$ , 473 nm) of **star polymer 2** aqueous solution (16 mg/L, pH = 1) in the presence of metal ions  $\text{Mg}^{2+}$ ,  $\text{Fe}^{3+}$ ,  $\text{Fe}^{2+}$ ,  $\text{Cu}^{2+}$ ,  $\text{Ce}^{4+}$ ,  $\text{Ca}^{2+}$ ,  $\text{Cd}^{2+}$ ,  $\text{Ru}^{3+}$ ,  $\text{Ni}^{2+}$ ,  $\text{In}^{3+}$ ,  $\text{Co}^{2+}$  and  $\text{Zn}^{2+}$  (193  $\mu\text{mol/L}$ ), in which  $I_0$  was used as the fluorescence intensity of **star polymer 2** aqueous solution without metal ion (blank).