

Supporting Information

1 Multidentate polymers stabilized water-dispersed copper nanoclusters: Facile
2 photoreduction synthesis and selective fluorescence Turn-On response

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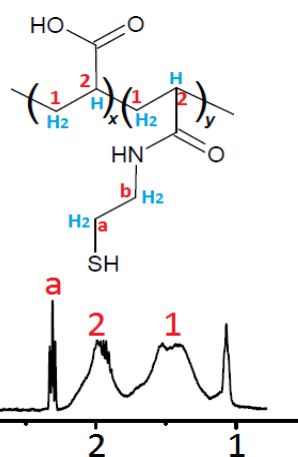
13 **Part S1. Synthesis of PAA-g-MEA**

14 Based on the previously reported methods,^[1,2] multidentate polymers (poly(acrylic acid)-*graft*-mercaptoethylamine,
15 PAA-g-MEA) were prepared. In a typical experiment, 15% of –COOH groups are nominally modified with MEA
16 portion. For a nominal 15% grafting percentage of PAA, briefly, 0.9 g of dried PAA powder (12.5 mmol based on –
17 COOH groups) was dissolved in 30 mL of MPD at 60 °C for 24 h. Then, the mixed solutions of 0.22 g dried MEA
18 (1.88 mmol) dissolved in 3 mL MPD and 0.44 g DCC (2.1 mmol) dissolved in 2 mL MPD were added into the
19 PAA solution under vigorous stirring. After a reaction for 72 h at 60 °C to produce a bifunctional grafted PAA
20 polymer with 15% of the –COOH functional groups modified with MEA portion. The reaction system was cooled
21 to room temperature, centrifuged and the precipitates were discarded, followed by the addition of 20 mL of 40 wt%
22 NaOH solution to precipitate the polymers. The precipitates were washed repeatedly with 10 mL of hot MPD at 60

Supporting Information

1 °C, and then with 12 mL of methanol at room temperature. After filtration, the products were dissolved in 10 mL of
2 water at 30 °C, and precipitated in 100 mL of methanol twice. The treated products were exposed to the air for 30
3 min, and then dissolved into 10 mL of water. The final dry products were obtained by freeze-drying. Each polymer
4 molecule contained ~3.6 thiol groups, as determined by typical ¹H-NMR spectrum of PAA-g-MEA (in **Fig. S1**).

5 The nominal 15% of grafting percentage PAA-g-MEA polymers were characterized by ¹H-NMR. The actual -SH
6 groups per single PAA chain determined by ¹H-NMR spectrum to be ~3.6 of -SH groups based on the peak area
7 ratio between -CH₂ groups from PAA backbone (at 1.35 ppm) and -CH₂ groups connected to -SH groups from the
8 MEA portion (at 2.32 ppm).



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11 **Fig. S1** ¹H-NMR spectra of the as-prepared PAA-g-MEA polymers.

12 References

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