

Electronic Supplementary Information (ESI)

Synthesis and characterization of ammonia-responsive polymer microgels

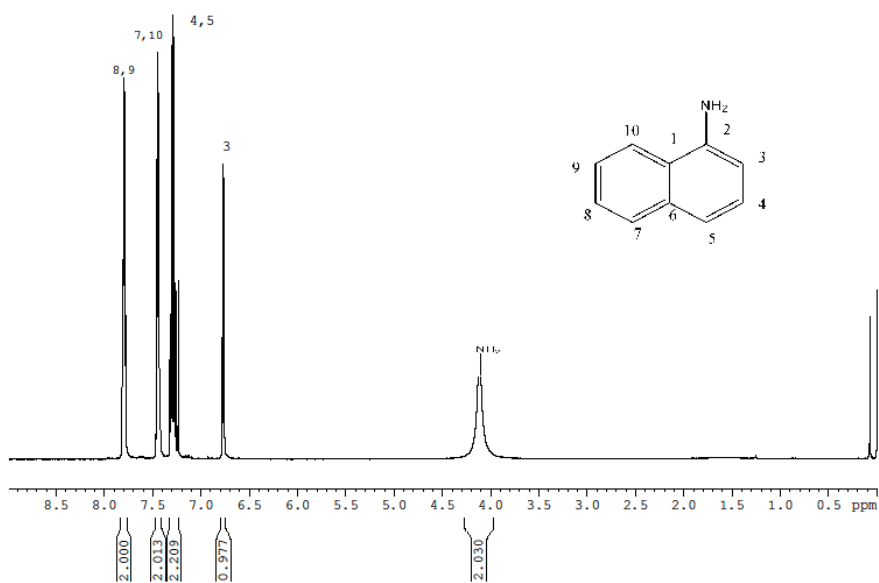
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(a)



(b)

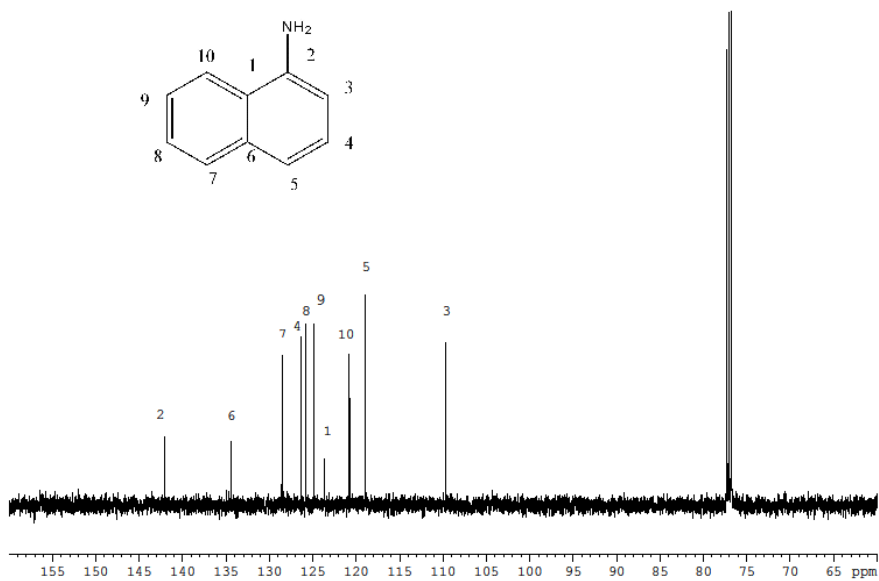
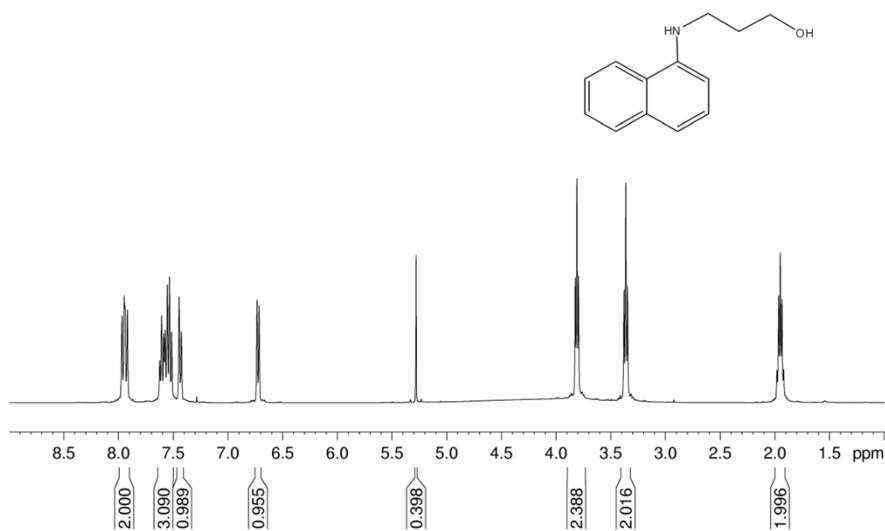


Fig. S1. (a) ¹H NMR and (b) ¹³C NMR spectra of 1-naphthylamine in CDCl₃.

(a)



(b)

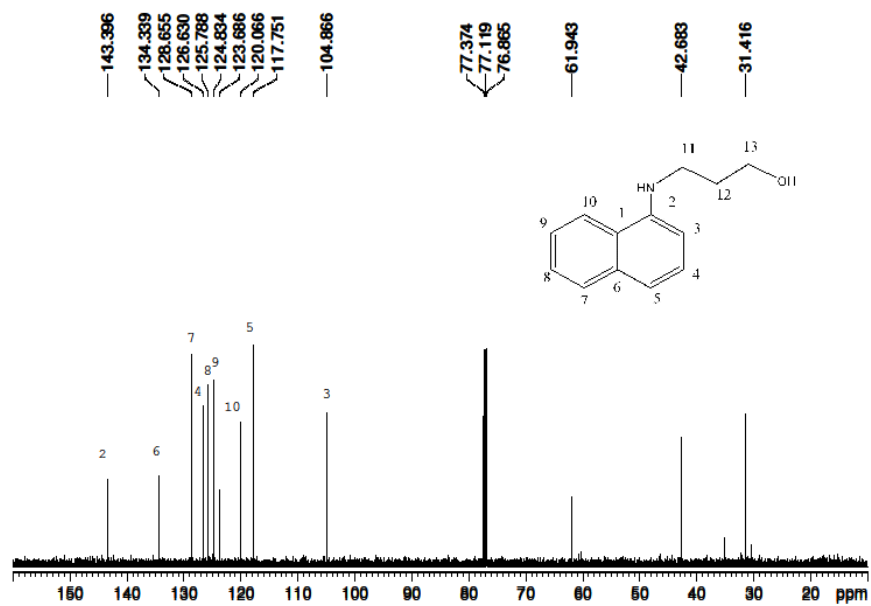


Fig. S2. (a) ^1H NMR and (b) ^{13}C NMR spectra of the intermediate *N*-(3-hydroxypropyl)-1-naphthylamine in CDCl_3 .

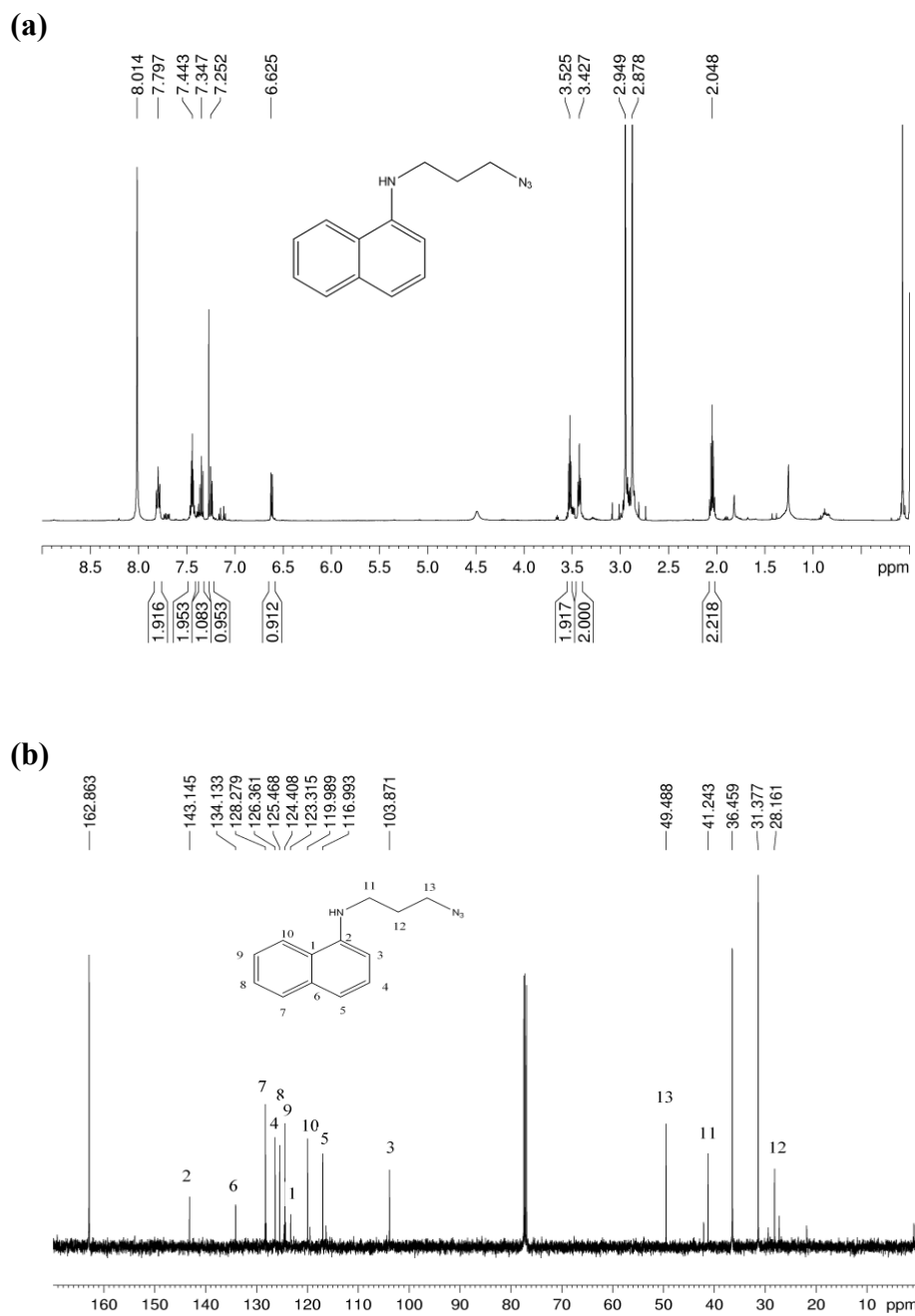


Fig. S3. (a) ^1H NMR and (b) ^{13}C NMR spectra of *N*-(3-azidopropyl)naphthalen-1-amine in CDCl_3 .

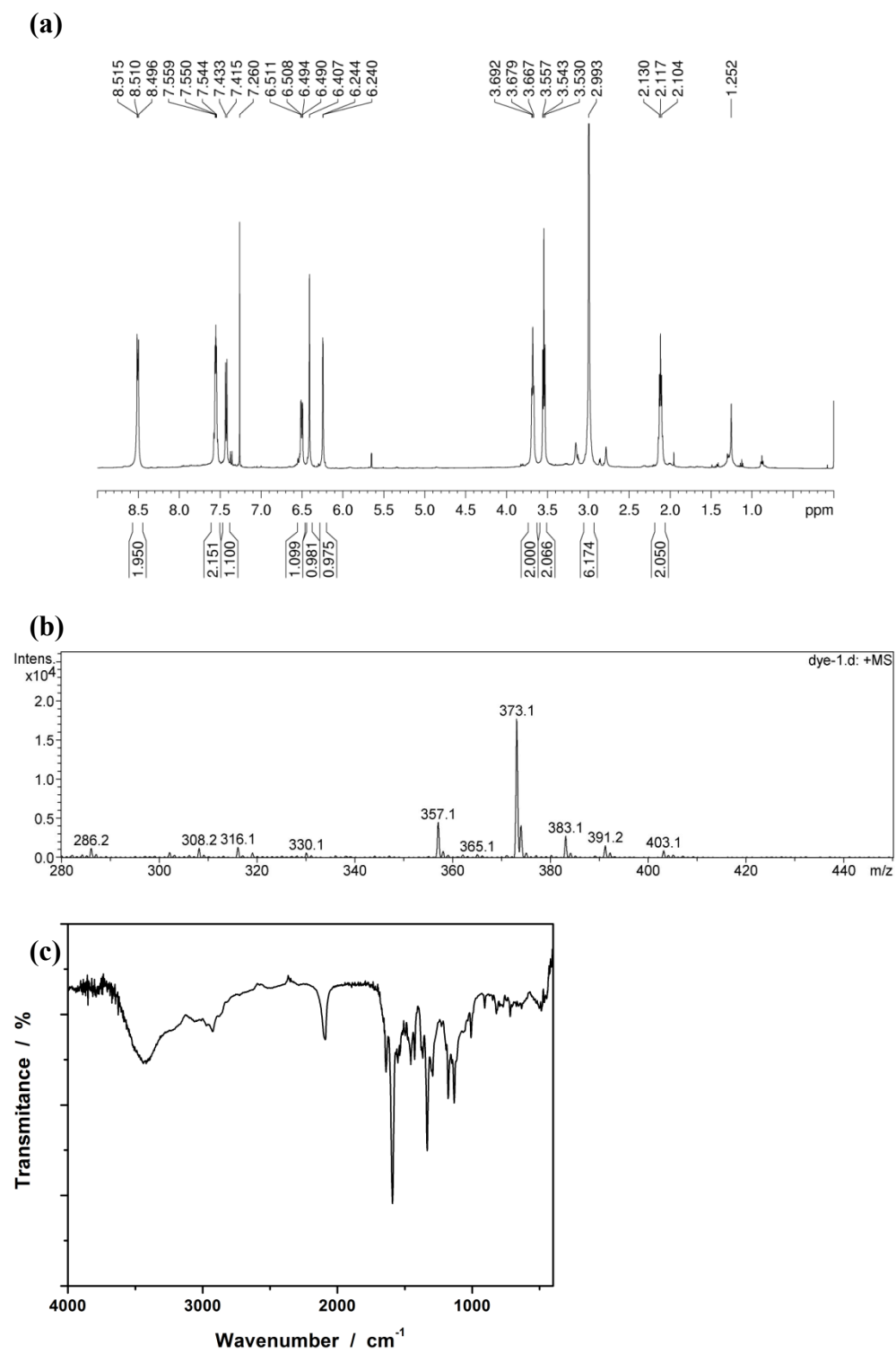


Fig. S4. (a) ^1H NMR (in CDCl_3), (b) ESI-MS, and (c) FTIR spectra of APO.

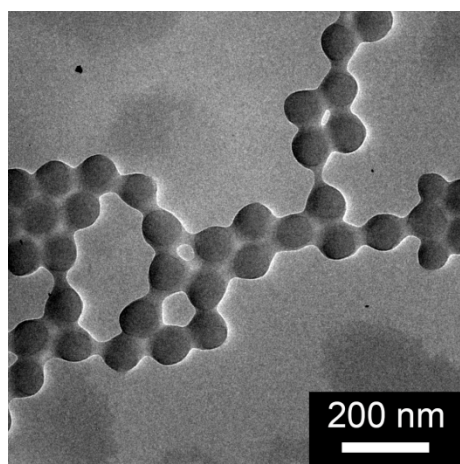


Fig. S5. Typical TEM image of the template microgels.

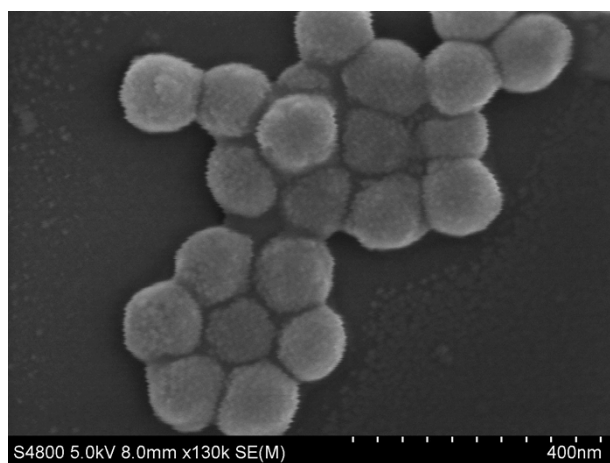


Fig. S6. Typical SEM image of the ARM microgels.

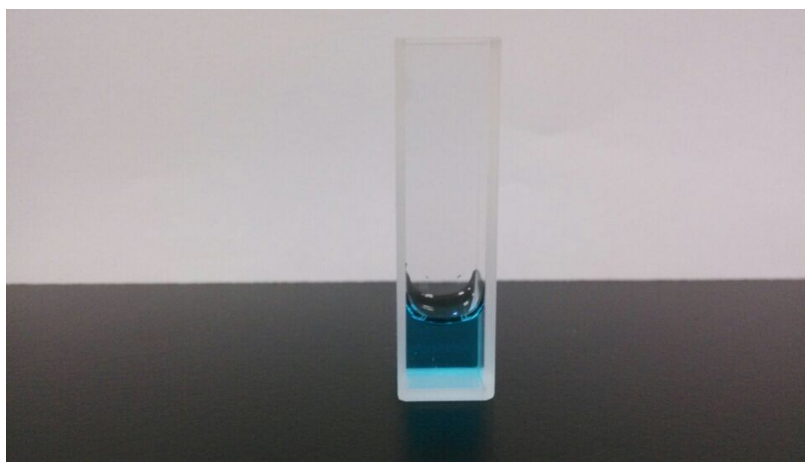


Fig. S7. Typical photograph of APO dispersed in aqueous.

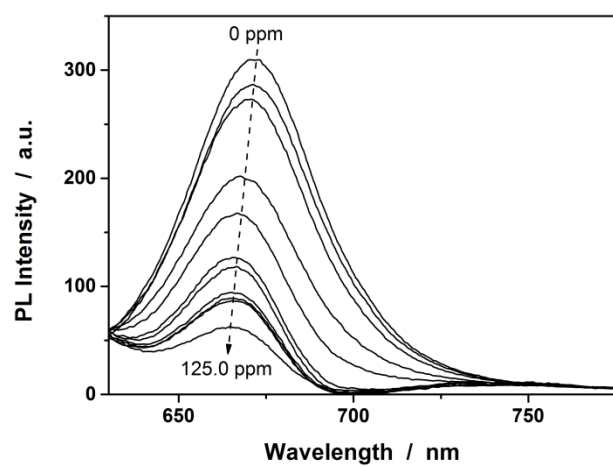


Fig. S8. Ammonia-dependent PL spectra of APO dispersed in aqueous.

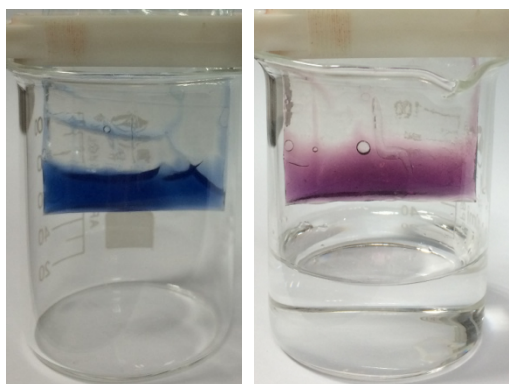


Fig. S9. Typical photograph of ARM microgel dispersion in a dialysis tube: (a) without and (b) in the presence of the ammonia vapor.

Table S1. Interference Tests on Ammonia Concentration Reading by using ARM Microgels

constituents	concentration	relative error ^a
acetone	100 ppm	+0.03%
methanol	100 ppm	+0.01%
ethanol	100 ppm	+0.01%
ethane	100 ppm	+0.02%
formaldehyde	100 ppm	+0.02%
pentane	100 ppm	+0.01%
H ₂	100 ppm	+0.01%
O ₂	100 ppm	+0.01%
CO	100 ppm	+0.02%
CO ₂ ^b	500 ppm	-1.47%
	5%	-2.31%
CS ₂	100 ppm	+0.09%
CH ₄	100 ppm	+0.01%
H ₂ O ₂	100 ppm	+0.03%
	100 ppm	-0.16%
H ₂ O	250 ppm	-0.16%
	500 ppm	-0.17%

^a “+” and “-” indicate an increase and decrease, respectively, in apparent ammonia concentration related to the actual ammonia concentration.

^b The atmosphere contains ca. 400ppm CO₂, and the air we exhale roughly contains 4-5% CO₂.