Supporting Information

Two-Way CO_2-Responsive Polymer Particles with Controllable Amphiphilic Properties

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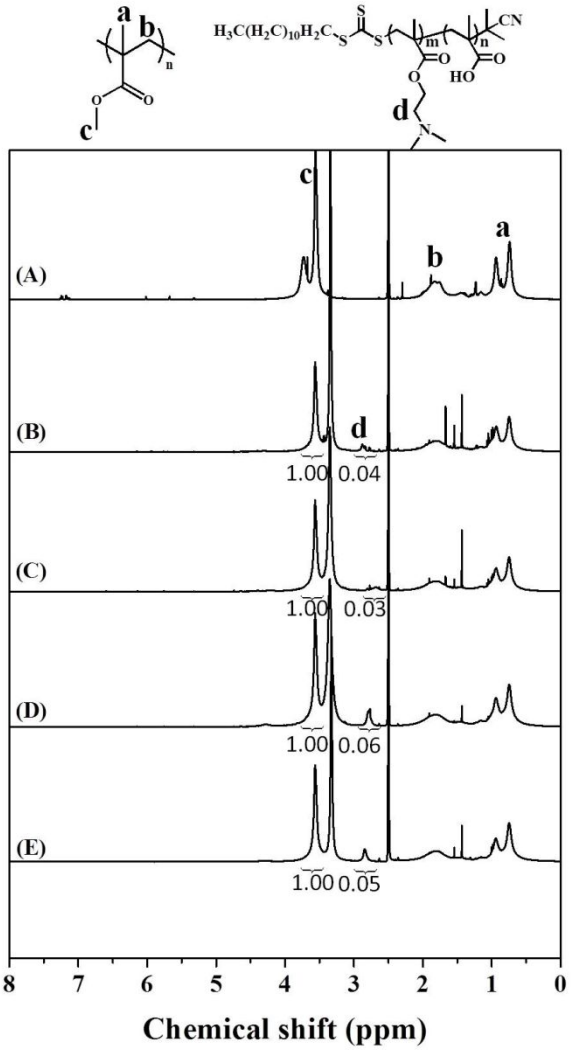

Figure S1: ^{1}H NMR spectra of **(A)** PMAA, **(B)** PMAA50-*b*-PDMAEMA7/PMMA, **(C)** PMAA50-*b*-PDMAEMA24/PMMA, **(D)** PMAA50-*b*-PDMAEMA72/PMMA and **(E)** PMAA50-*b*-PDMAEMA266/PMMA in DMSO-d_6.

Table S1: Weight fraction of PMAA-*b*-PDMAEMA in the PMMA as determined from the ^{1}H NMR spectra in Figure S1.

	Expected (%) [a]	Observed (%)[b]
PMAA50-*b*-PDMAEMA7/PMMA	5	4
PMAA50-*b*-PDMAEMA24/PMMA	5	3
PMAA50-*b*-PDMAEMA72/PMMA	5	6
PMAA50-*b*-PDMAEMA266/PMMA	5	5

a. Expected weight fraction of PMAA-*b*-PDMAEMA obtained from theoretical stoichiometry value.
b. Observed weight fraction of PMAA-*b*-PDMAEMA obtained from integration in the ^{1}H NMR spectra.

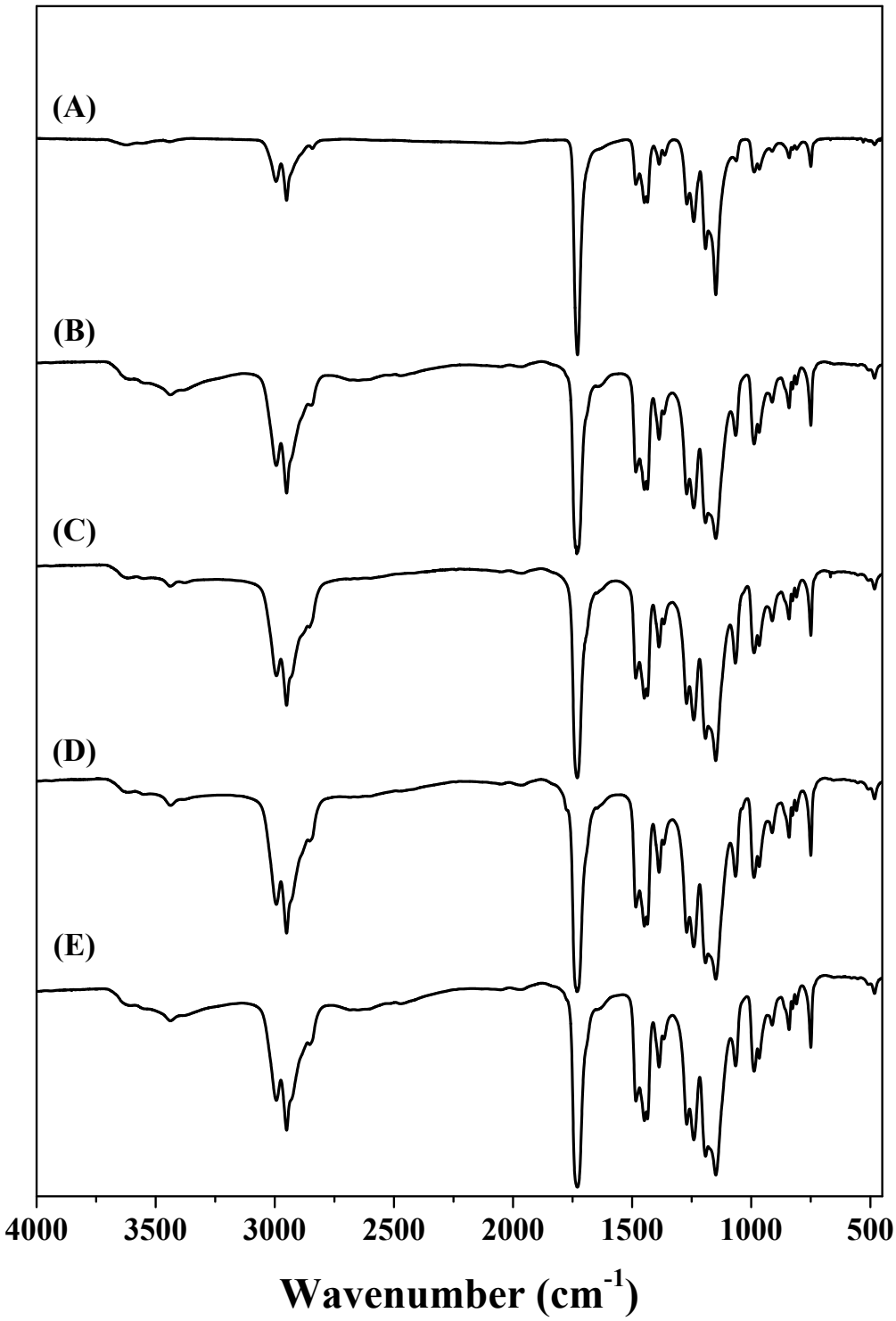

Figure S2: FTIR spectra of **(A)** PMMA, **(B)** PMAA50-*b*-PDMAEMA7/PMMA, **(C)** PMAA50-*b*-PDMAEMA24/PMMA, **(D)** PMAA50-*b*-PDMAEMA72/PMMA and **(E)** PMAA50-*b*-PDMAEMA266/PMMA latexes-prepared at pH 2

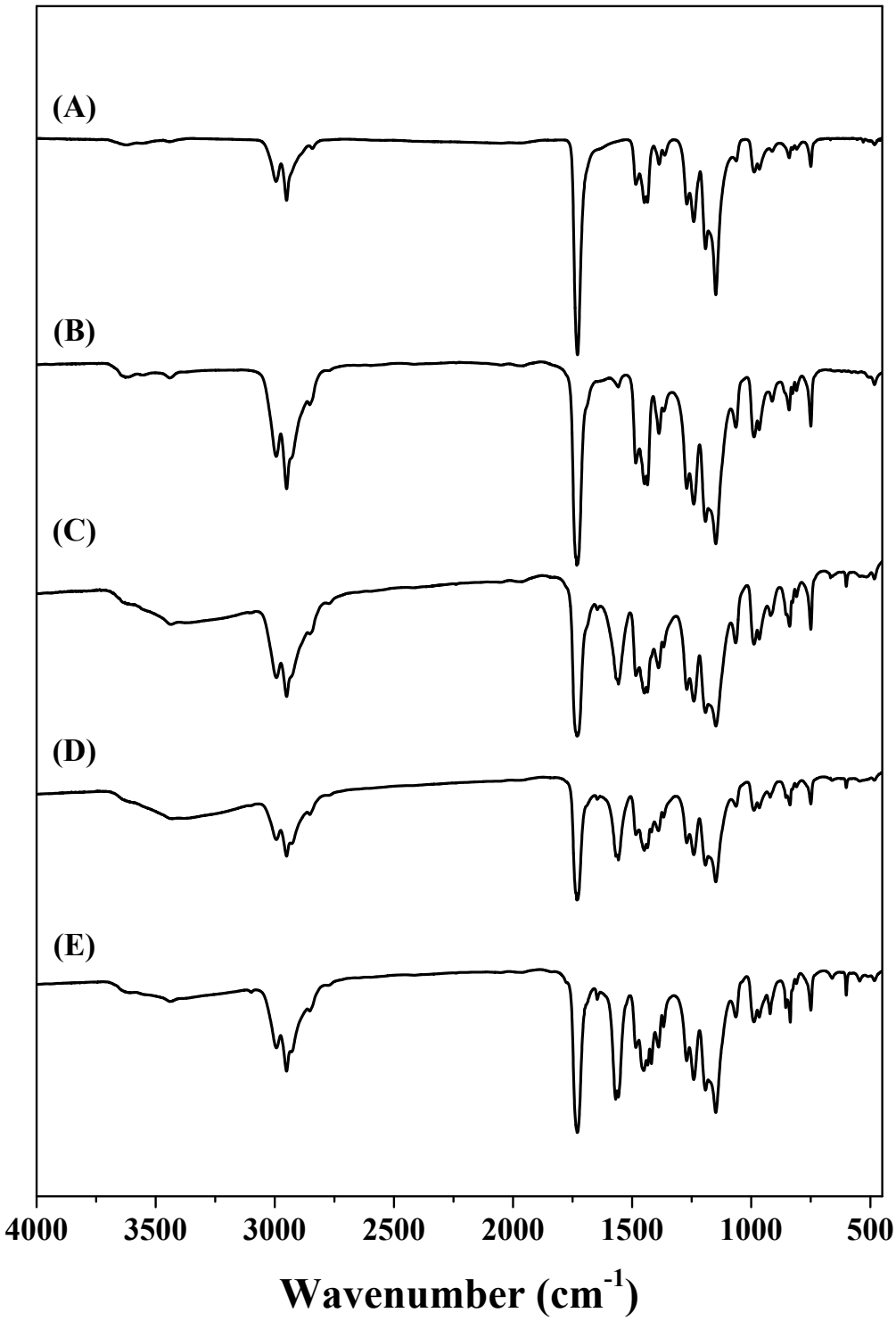

Figure S3: FTIR spectra of **(A)** PMMA, **(B)** PMAA50-*b*-PDMAEMA7/PMMA, **(C)** PMAA50-*b*-PDMAEMA24/PMMA, **(D)** PMAA50-*b*-PDMAEMA72/PMMA and **(E)** PMAA50-*b*-PDMAEMA266/PMMA latexes prepared at pH 12.

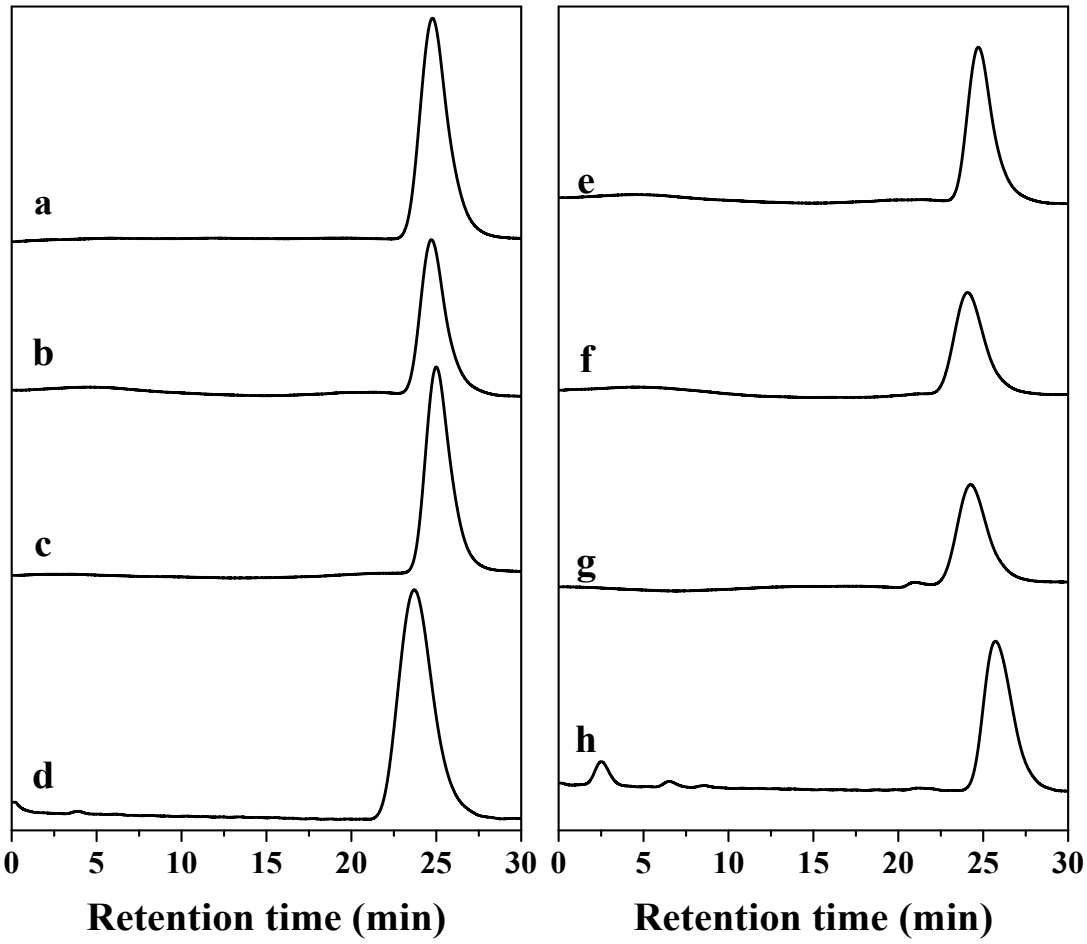

Figure S4: GPC curves of **(a, e)** PMAA50-*b*-PDMAEMA7/PMMA, **(b, f)** PMAA50-*b*-PDMAEMA24/PMMA, **(c, g)** PMAA 50-*b*-PDMAEMA72/PMMA and **(d, h)** PMAA50-*b*-PDMAEMA266/PMMA. The PMMA latex particles in (**a** to **d**) were prepared at pH 2 and (**e** to **h**), at pH 12.

Table S2: M_n, M_w, and dispersity ($Đ_M$) calculated from the GPC curves of PMMA latex particles prepared at pH 2 and pH 12.

PMMA latex particle	pH 2			pH 12		
	M_n	M_w	$Đ_M$	M_n	M_w	$Đ_M$
PMAA50-*b*-PDMAEMA7/PMMA	158,400	199,600	1.26	163,900	201,600	1.23
PMAA50-*b*-PDMAEMA24/PMMA	107,300	89,200	1.20	231,800	293,200	1.26
PMAA50-*b*-PDMAEMA72/PMMA	144,700	173,900	1.20	212,900	267,600	1.25
PMAA50-*b*-PDMAEMA266/PMMA	282,900	373,300	1.3	98,300	118,000	1.20

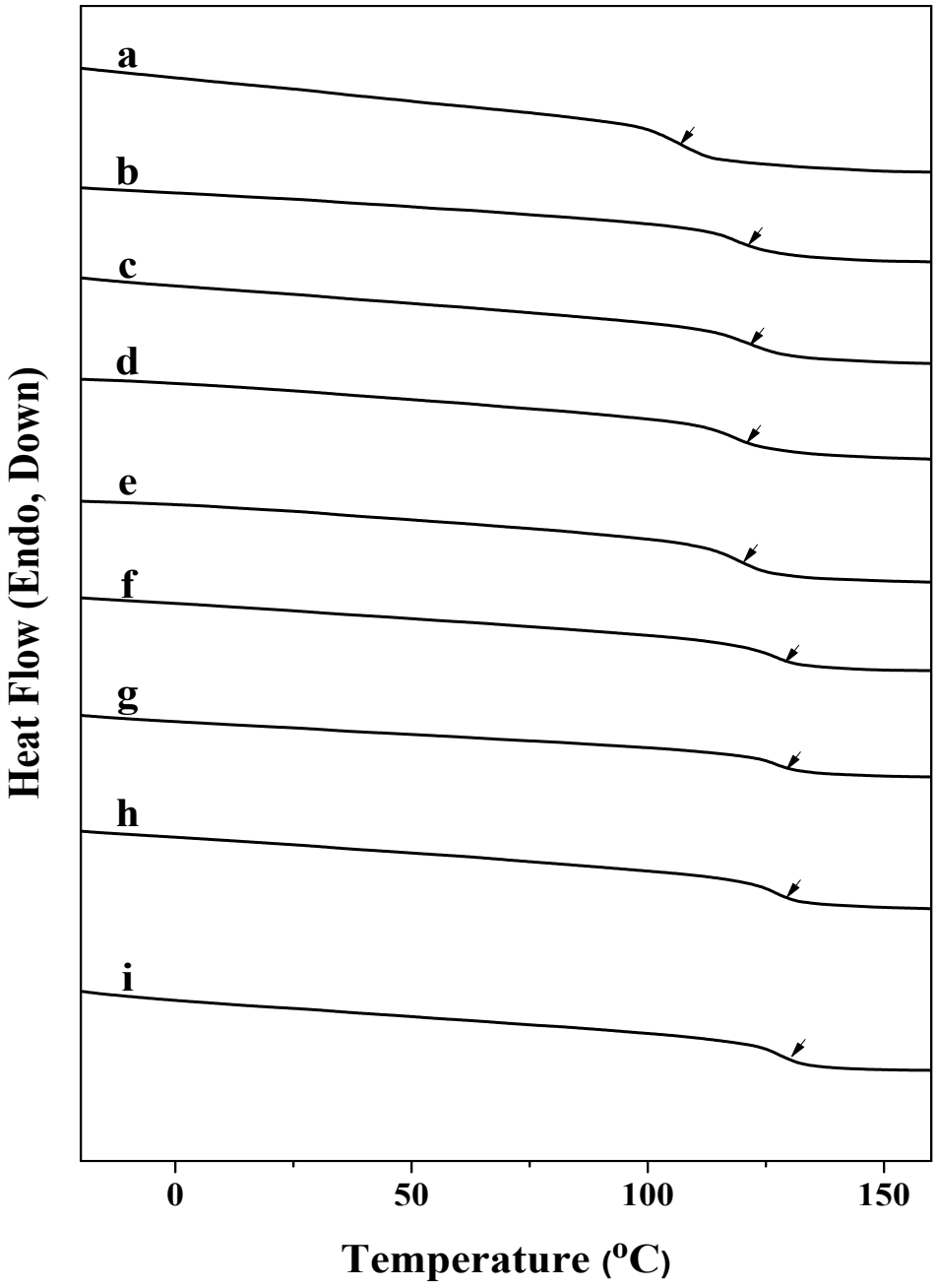

Figure S5: DSC curves of **(a)** PMMA, **(b, f)** PMAA50-*b*-PDMAEMA7/PMMA, **(c, g)** PMAA50-*b*-PDMAEMA24/PMMA, **(d, h)** PMAA 50-*b*-PDMAEMA72/PMMA and **(e, i)** PMAA50-*b*-PDMAEMA266/PMMA. PMMA latex particles in (**b** to **e**) were prepared at pH 2 and (**f** to **i**), at pH 12.

Table S3: T_g (°C) of PMMA, PMAA50-*b*-PDMAEMA7/PMMA, PMAA50-*b*-PDMAEMA24/PMMA, PMAA50-*b*-PDMAEMA72/PMMA and PMAA50-*b*-PDMAEMA266/PMMA determined from the DSC measurements shown in Figure S5.

Sample	T_g (°C)	
	pH 2	pH 12
Pure PMMA	106	
PMAA50-*b*-PDMAEMA7/PMMA	117.9	126.0
PMAA50-*b*-PDMAEMA24/PMMA	122.3	127.1
PMAA50-*b*-PDMAEMA72/PMMA	118.5	125.9
PMAA50-*b*-PDMAEMA266/PMMA	120.2	129.1

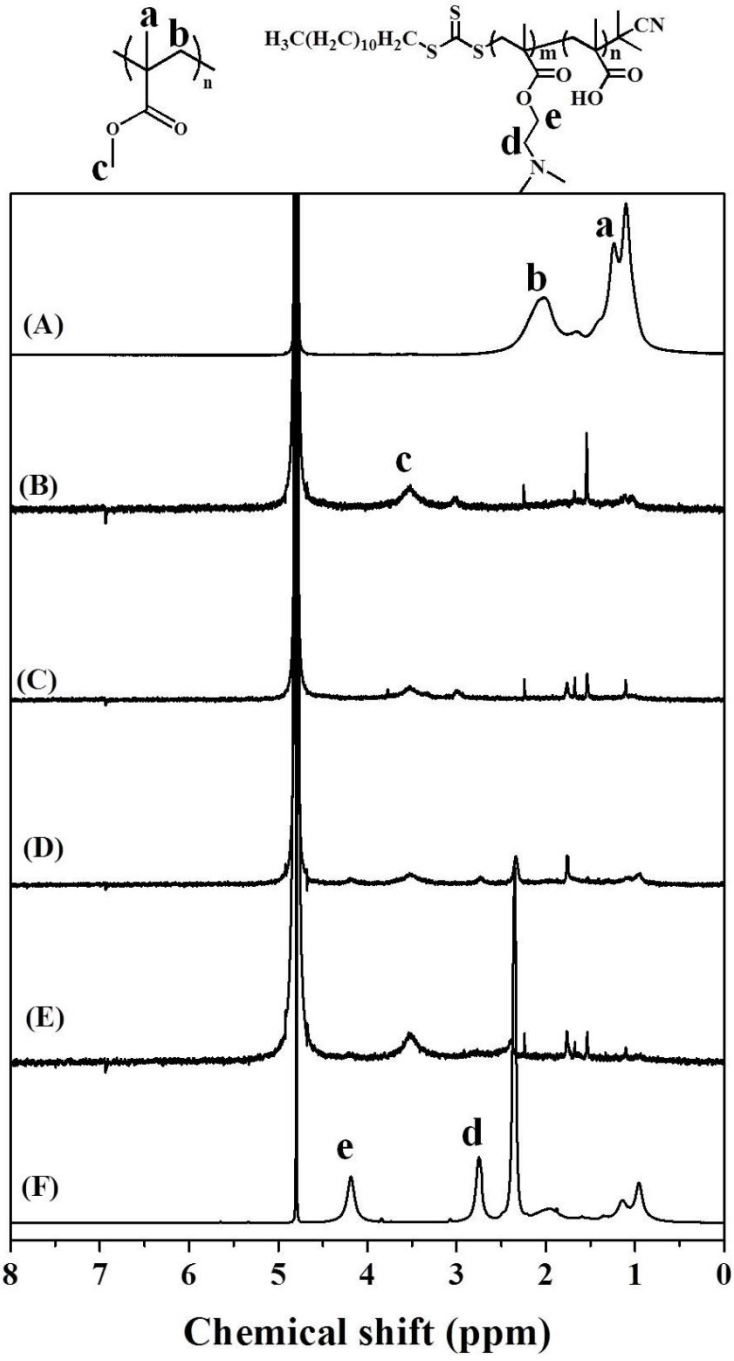

Figure S6: ^{1}H NMR spectra of (A) PMAA, (B) PMAA50-*b*-PDMAEMA7/PMMA, (C) PMAA50-*b*-PDMAEMA24/PMMA, (D) PMAA50-*b*-PDMAEMA72/PMMA, (E) PMAA50-*b*-PDMAEMA266/PMMA, and (F) PDMAEMA in deuterium oxide (D_2O). The PMAA-*b*-PDMAEMA/PMMA latexes were prepared at pH 2.

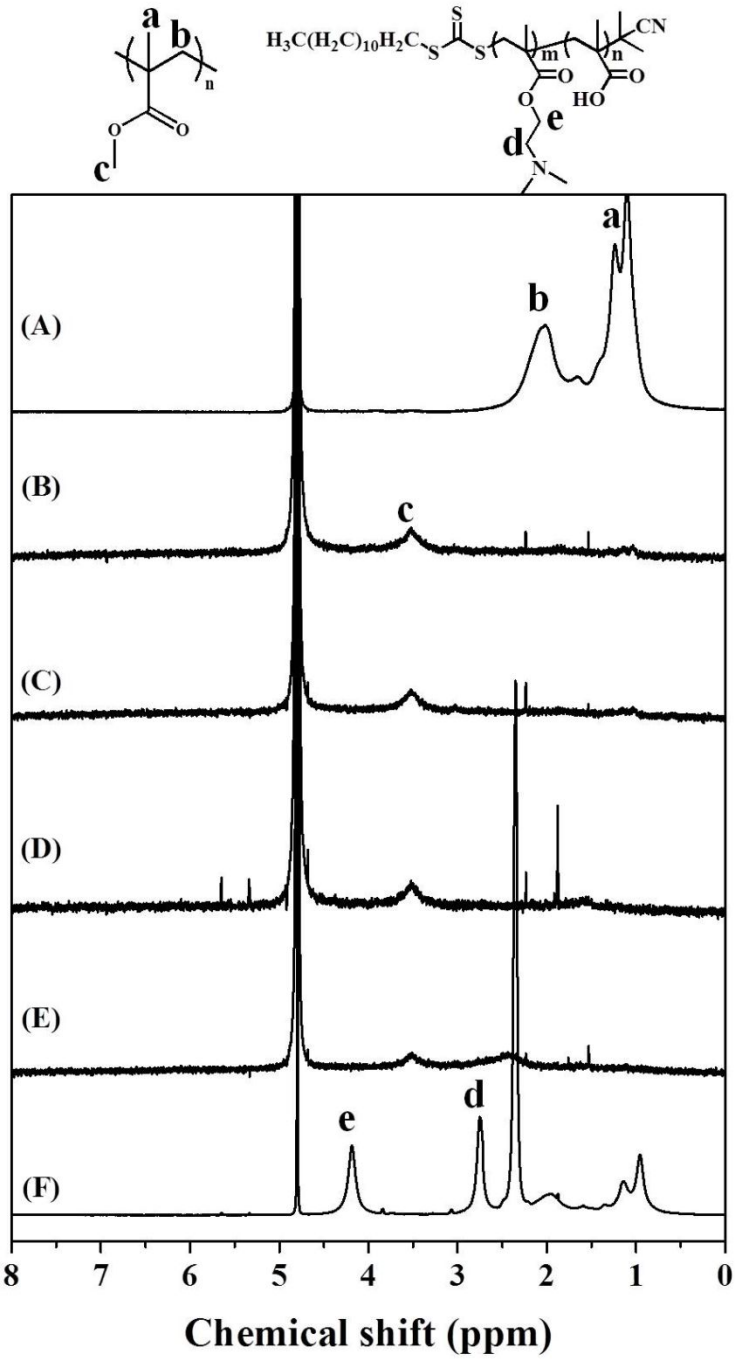

Figure S7: ^{1}H NMR spectra of (A) PMAA, (B) PMAA50-*b*-PDMAEMA7/PMMA, (C) PMAA50-*b*-PDMAEMA24/PMMA, (D) PMAA50-*b*-PDMAEMA72/PMMA, (E) PMAA50-*b*-PDMAEMA266/PMMA, and (F) PDMAEMA in D_2O. The PMAA-*b*-PDMAEMA/PMMA latexes were prepared at pH 12.