Electronic Supplementary Material (ESI) for Polymer Chemistry.

Preparation of amphiphilic copolymers via base-catalyzed hydrolysis of quaternized poly[2-(dimethylamino)ethyl methacrylate]

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Supporting Information

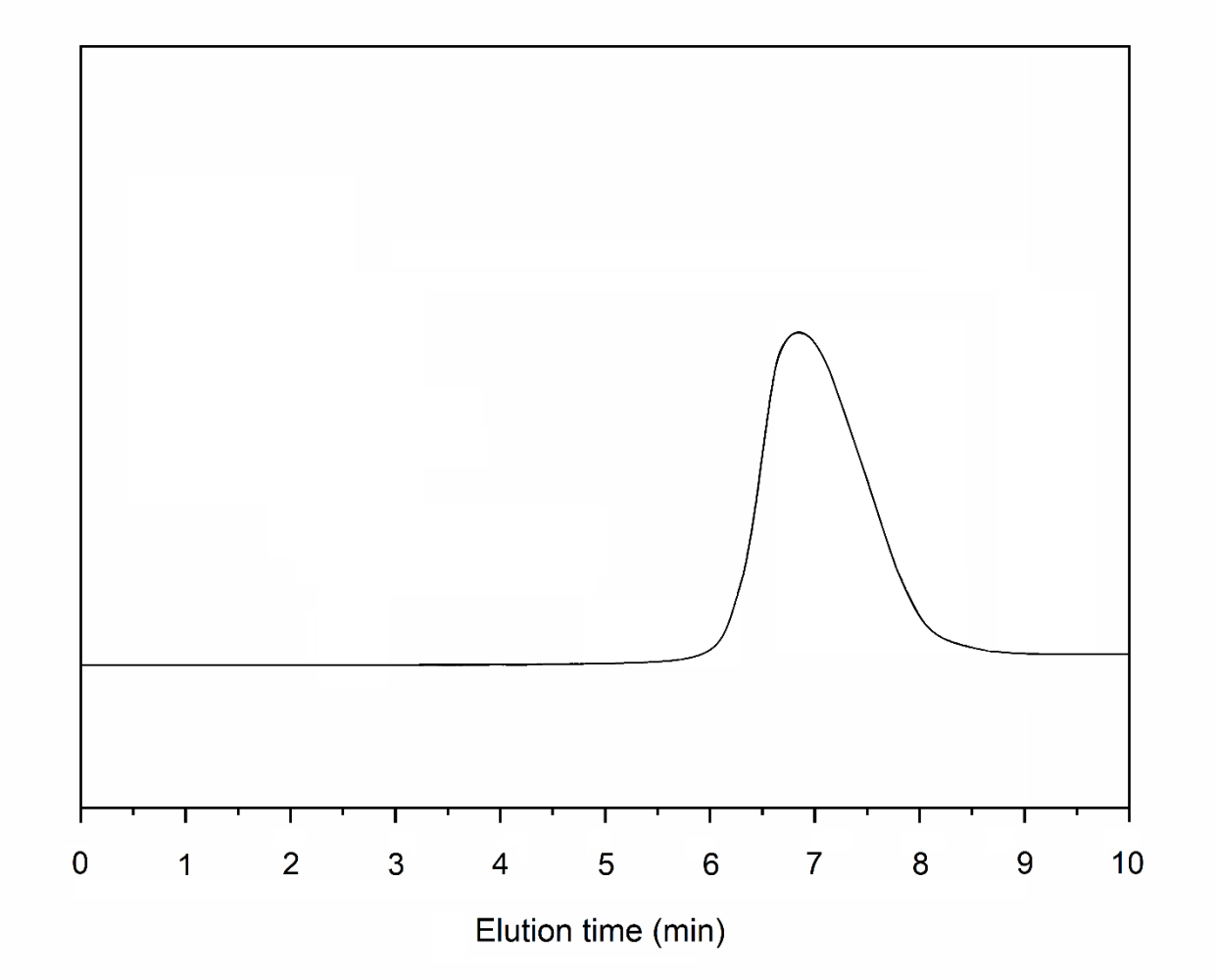

Figure S1. GPC curve of PDMAEMA prepared by ATRP.

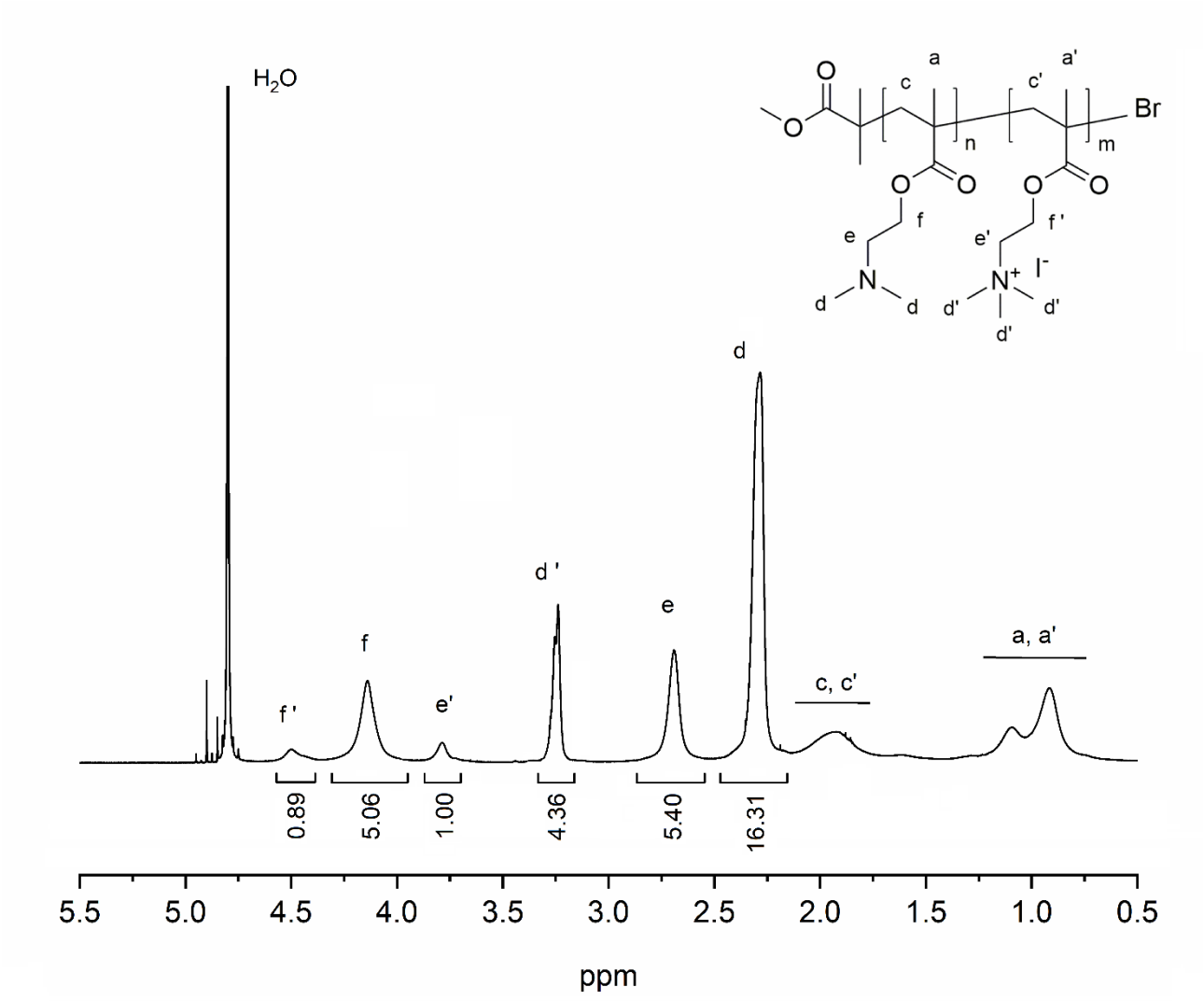

Figure S2. ^{1}H NMR spectrum of q_{15}PDMAEMA in D_2O.

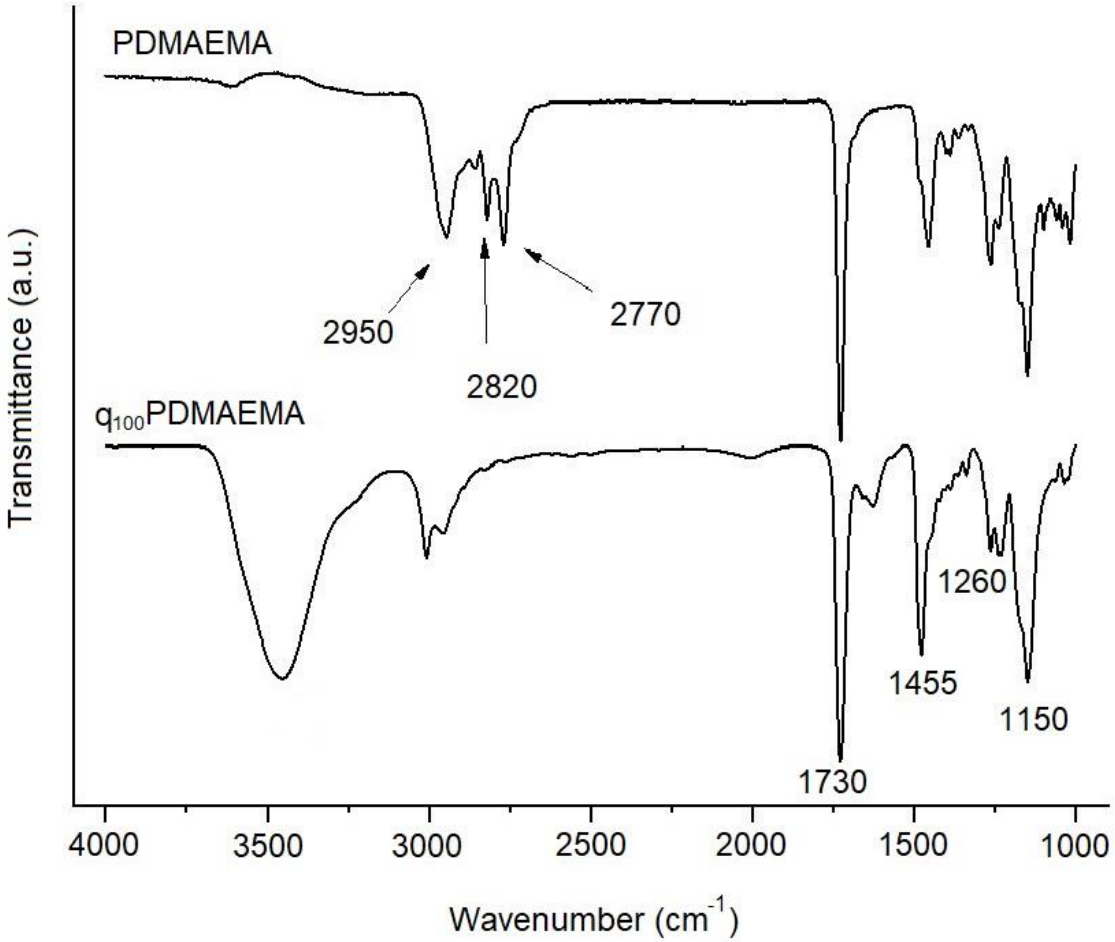

Figure S3. FT-IR spectra of pristine PDMAEMA and q_{100}PDMAEMA.

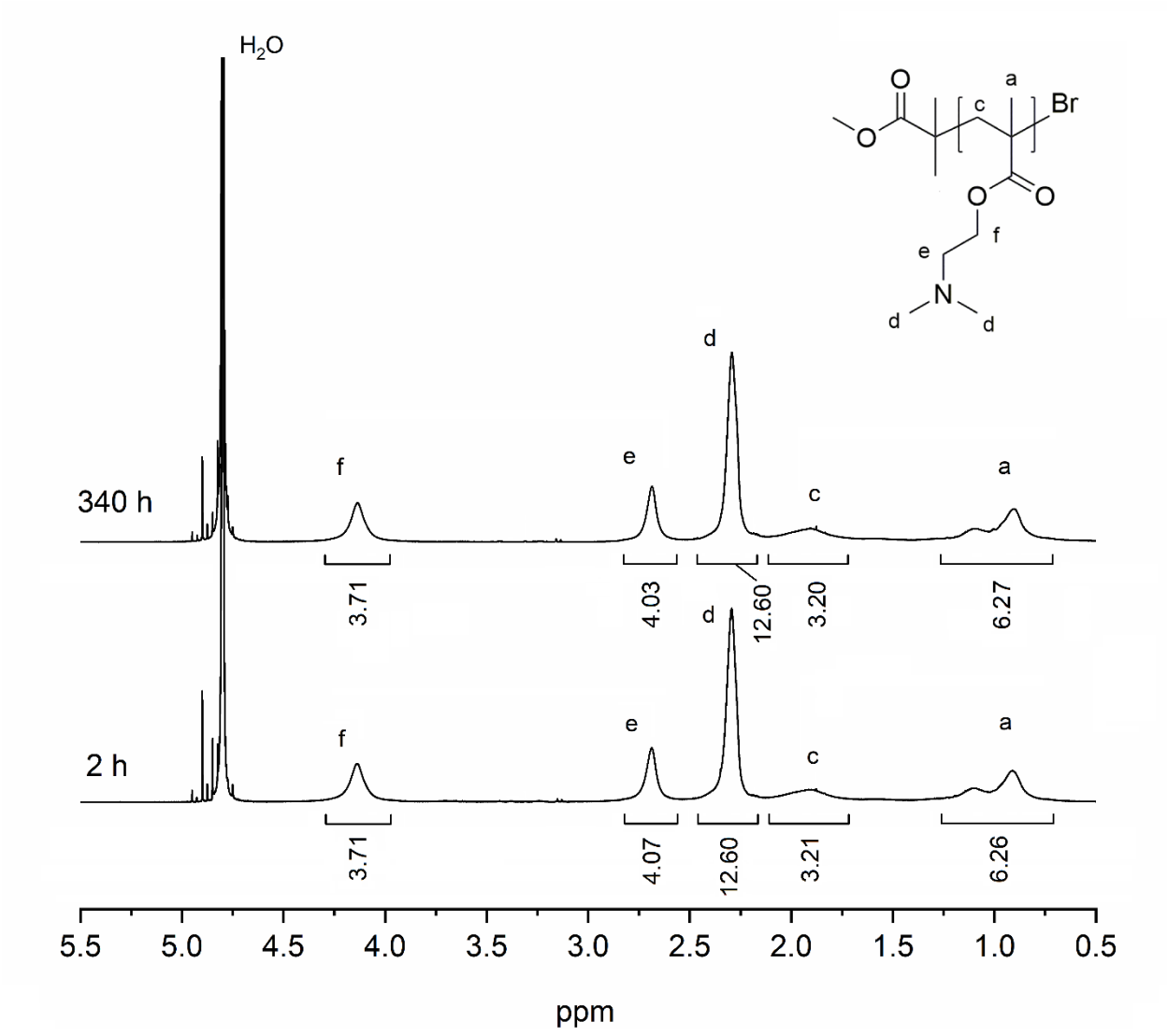

Figure S4. ^{1}H NMR spectra of pristine PDMAEMA after being dissolved in 0.25 M NaOD solution for 2 h and 340 h at 25 ℃.

Table S1. Results of ^{1}H NMR peaks' integration of q_{50}PDMAEMA spectra in Fig. 2 for (A) 2 h, (B) 10 h, (C) 25 h, (D) 50 h, and (E) 340 h.

	Areas under peaks calculated via intergration						
Spectra	**f '**	**f**	**j**	**e '**	**i**	**d '**	**h**
A	2.64	3.08	0.32	2.55	0.31	12.50	1.54
B	2.41	3.09	0.55	2.34	0.59	11.20	2.72
C	2.07	3.07	0.89	2.10	0.87	9.80	4.13
D	1.86	3.08	1.11	1.80	1.07	8.75	5.57
E	1.34	3.05	1.62	1.30	1.57	6.37	7.68

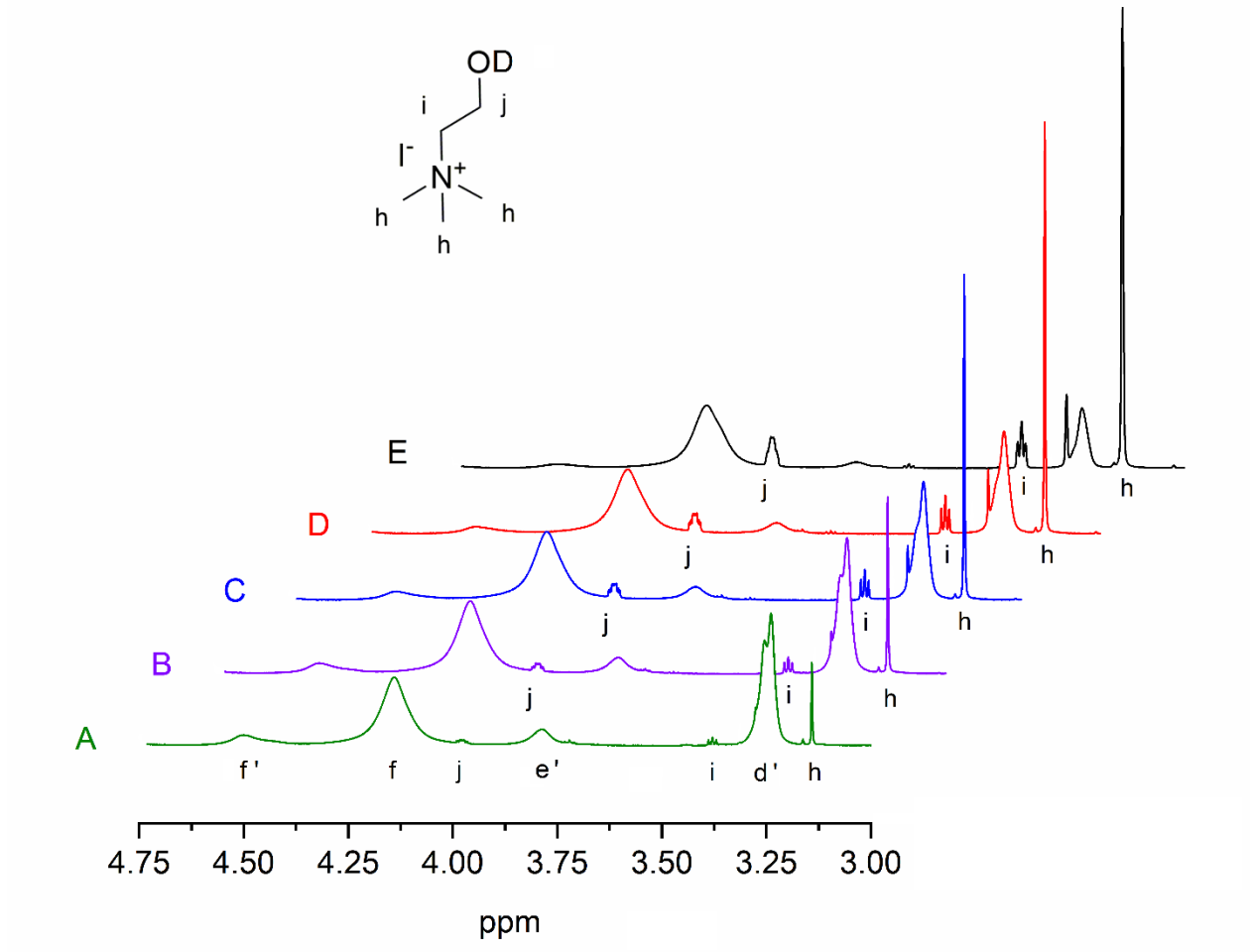

Figure S5. ^{1}H NMR spectra of q_{15}PDMAEMA dissolved in 0.25 M NaOD solution for (A) 2 h, (B) 10 h, (C) 25 h, (D) 50 h, and (E) 340 h at 25 ℃. Peaks integrations are displayed in Table S2.

Table S2. Results of ^{1}H NMR peaks' integrations of q_{15}PDMAEMA spectra in Fig. S5 for (A) 2 h, (B) 10 h, (C) 25 h, (D) 50 h, and (E) 340 h.

	Areas under peaks calculated via intergration						
Spectra	**f '**	**f**	**j**	**e '**	**i**	**d '**	**h**
A	1.46	9.83	0.29	1.49	0.28	7.03	0.86
B	1.33	9.87	0.42	1.33	0.43	6.02	1.86
C	1.18	9.84	0.57	1.22	0.55	5.59	2.30
D	1.07	9.83	0.68	1.03	0.73	4.68	3.20
E	0.58	9.85	1.17	0.60	1.17	2.59	5.29

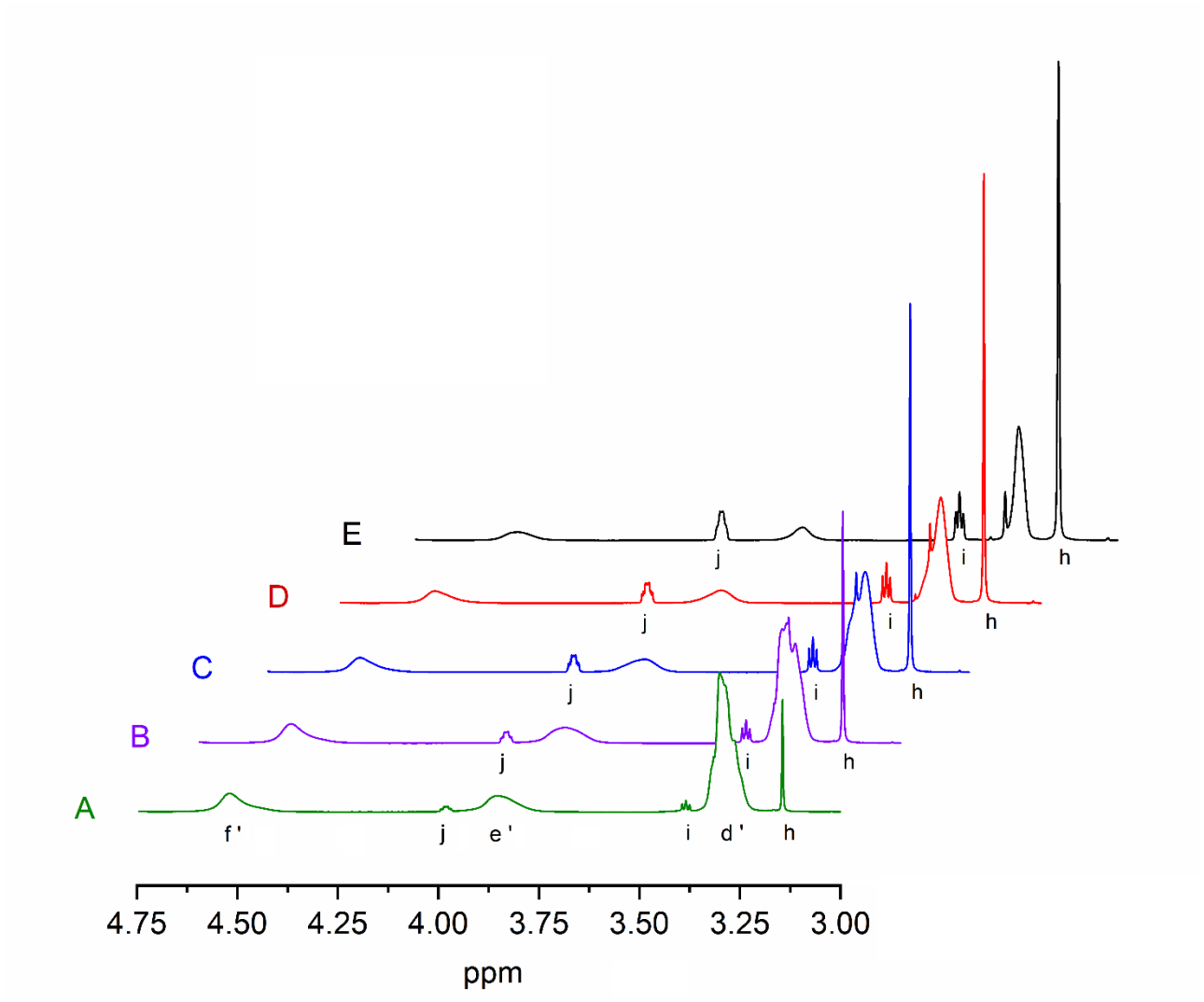

Figure S6. ^{1}H NMR spectra of q_{100}PDMAEMA dissolved in 0.25 M NaOD solution for (A) 2 h, (B) 10 h, (C) 25 h, (D) 50 h, and (E) 340 h at 25 ℃. Peaks integrations are displayed in Table S3.

Table S3. Results of ^{1}H NMR peaks' integrations of q_{100}PDMAEMA spectra in Fig. S6 for (A) 2 h, (B) 10 h, (C) 25 h, (D) 50 h, and (E) 340 h.

	Areas under peaks calculated via intergration					
Spectra	**f '**	**j**	**e '**	**i**	**d '**	**h**
A	3.84	0.36	3.66	0.34	18.98	1.72
B	3.56	0.64	3.40	0.60	17.53	3.17
C	3.17	1.03	3.04	0.96	15.61	5.09
D	2.92	1.28	2.80	1.20	14.28	6.42
E	2.22	1.98	2.12	1.88	10.87	9.83

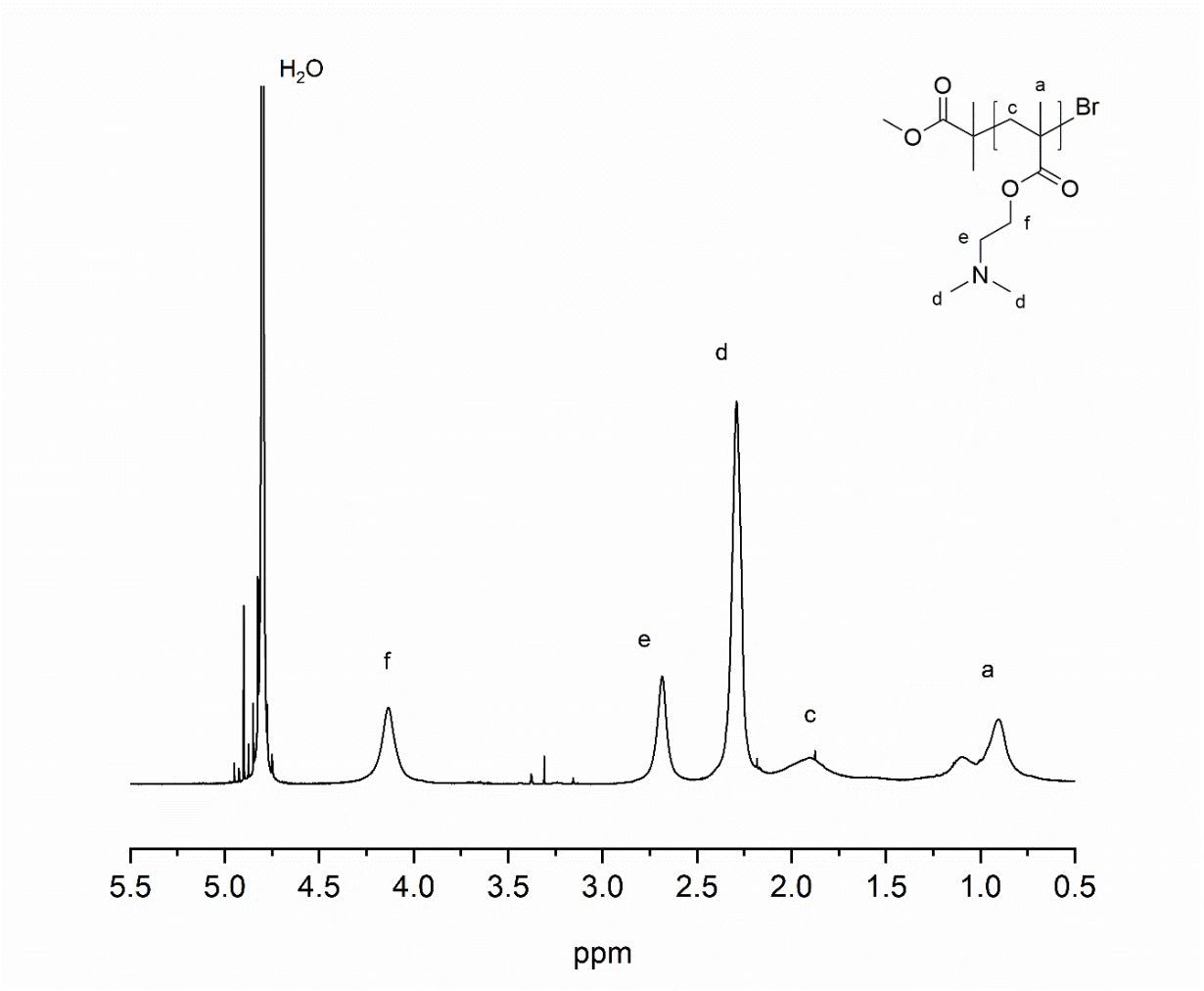

Figure S7. ^{1}H NMR spectrum of pristine PDMAEMA (in D_2O) after being dissolved in 1 M NaOH solution for 5 days at 25 ℃.

Fig. S7 displays the ^{1}H NMR spectrum of PDMAEMA that was left to hydrolyze for 5 days in 1 M NaOH aqueous solution. It was anticipated that PDMAEMA would at least to a small degree decompose into PMAA and (dimethylamino)ethanol DMAE small molecules. To be able to detect DMAE, precautions were taken to avoid the loss of this side product, namely, after hydrolysis alkali was neutralized using aqueous HCl solution and then the mixture was placed directly in a drying oven set to 60 ℃.

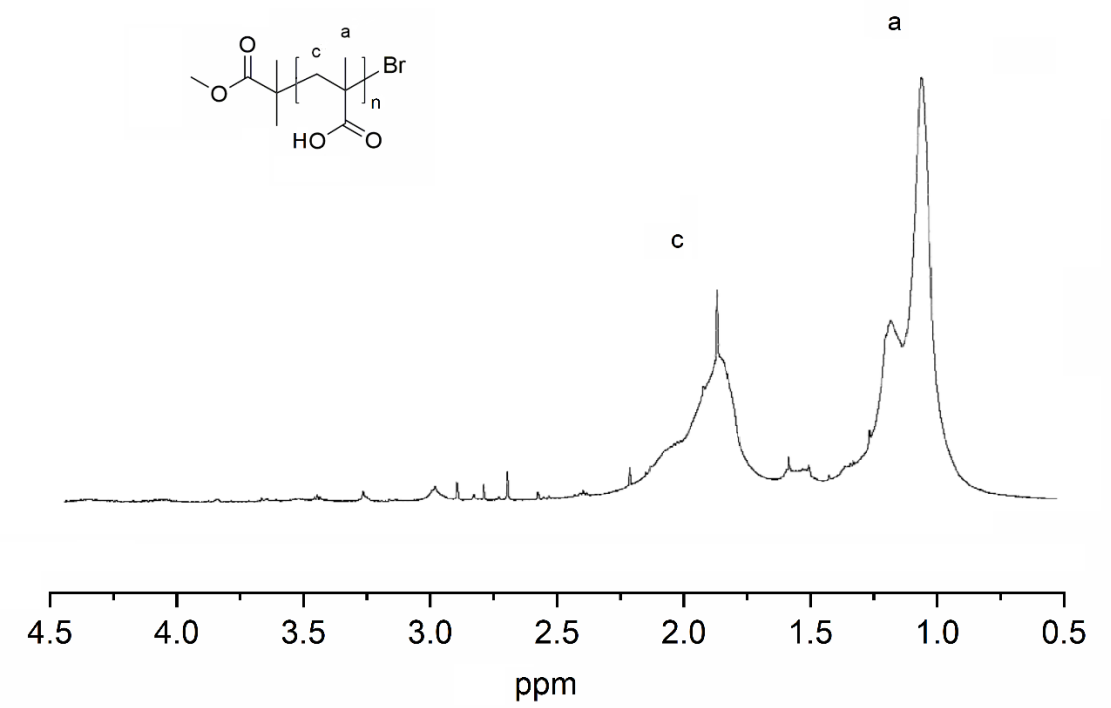

Figure S8. ^{1}H NMR spectrum of q_{100}PDMAEMA (in D_2O) after being dissolved in 1 M NaOH solution for 5 days at 25 ℃.

Fig. S8 shows the ^{1}H NMR spectrum of q_{100}PDMAEMA that was left to hydrolyze under the same conditions as pure PDMAEMA (5 days, 1 M NaOH aqueous solution). In order to avoid confusion, it was reasonable to analyze the chemical structure of the resulting polymer alone. So, to do that, after hydrolysis, this sample was purified by aqueous dialysis using a membrane bag to ensure the removal of choline iodide (small molecule byproduct).

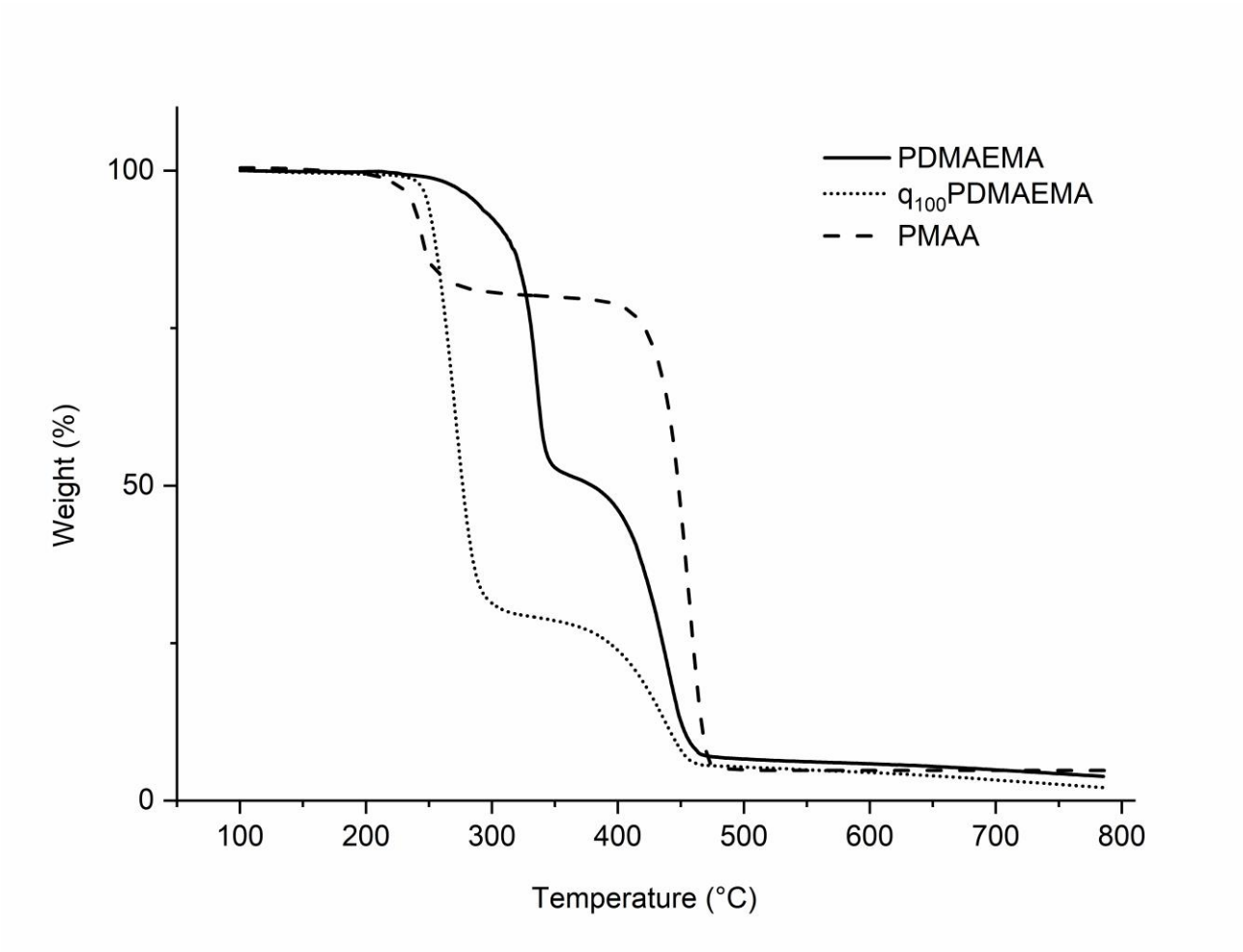

Figure S9. TGA curves of pristine PDMAEMA, q_{100}PDMAEMA, and PMAA (obtained by hydrolysis of q_{100}PDMAEMA).

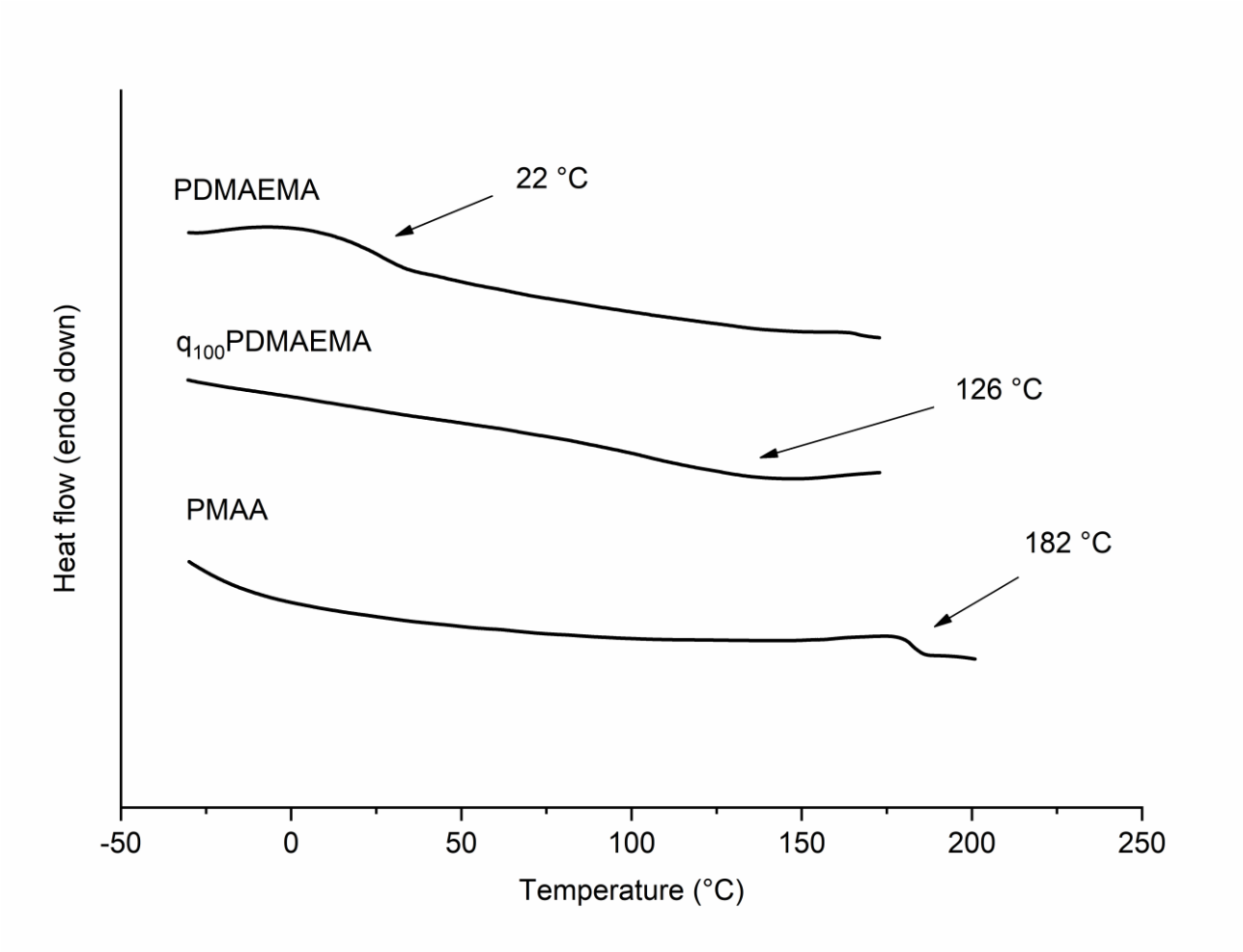

Figure S10. DSC curves of pristine PDMAEMA, q_{100}PDMAEMA, and PMAA (obtained by hydrolysis of q_{100}PDMAEMA).