Electronic Supplementary Materials:

Direct Synthesis of Various Polar Functionalized Polypropylene with Tunable Molecular Weights and High Incorporation Ratios

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1. Spectra Data

1.1 ^{1}H NMR and ^{13}C NMR of Some Representative Polymers.

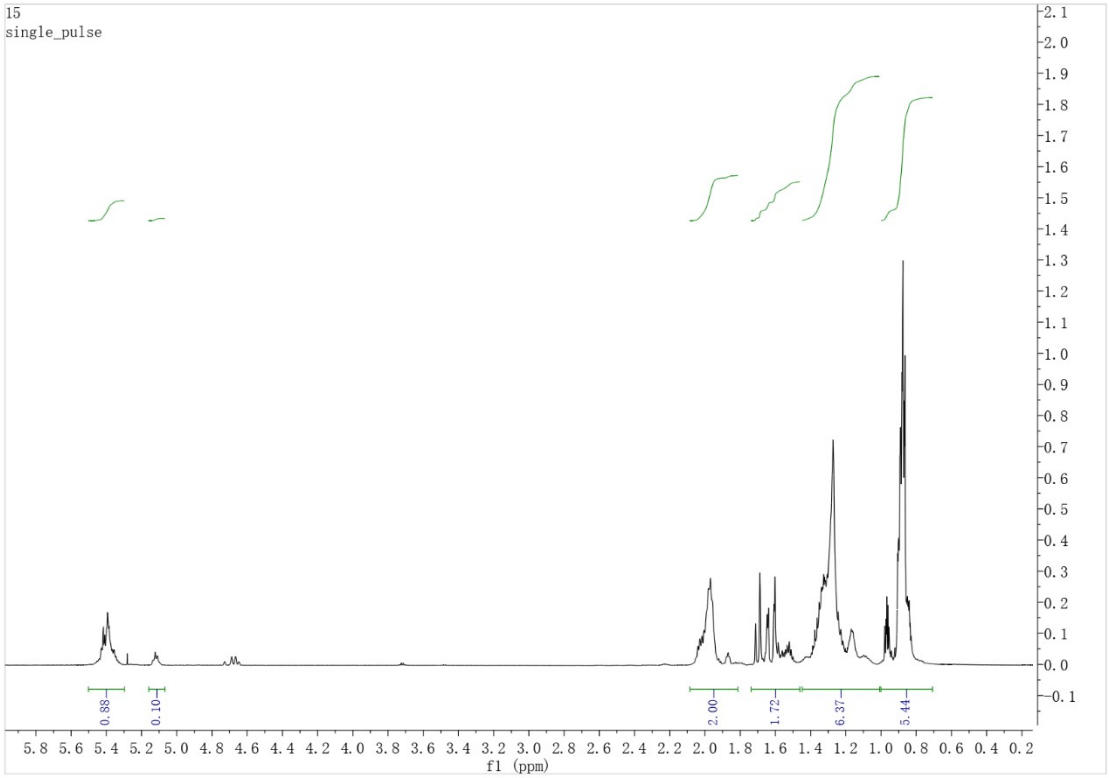


Figure S1. ^{1}H NMR spectrum of the polymer from table 1, entry 1 ($CDCl_3$, 20 °C).

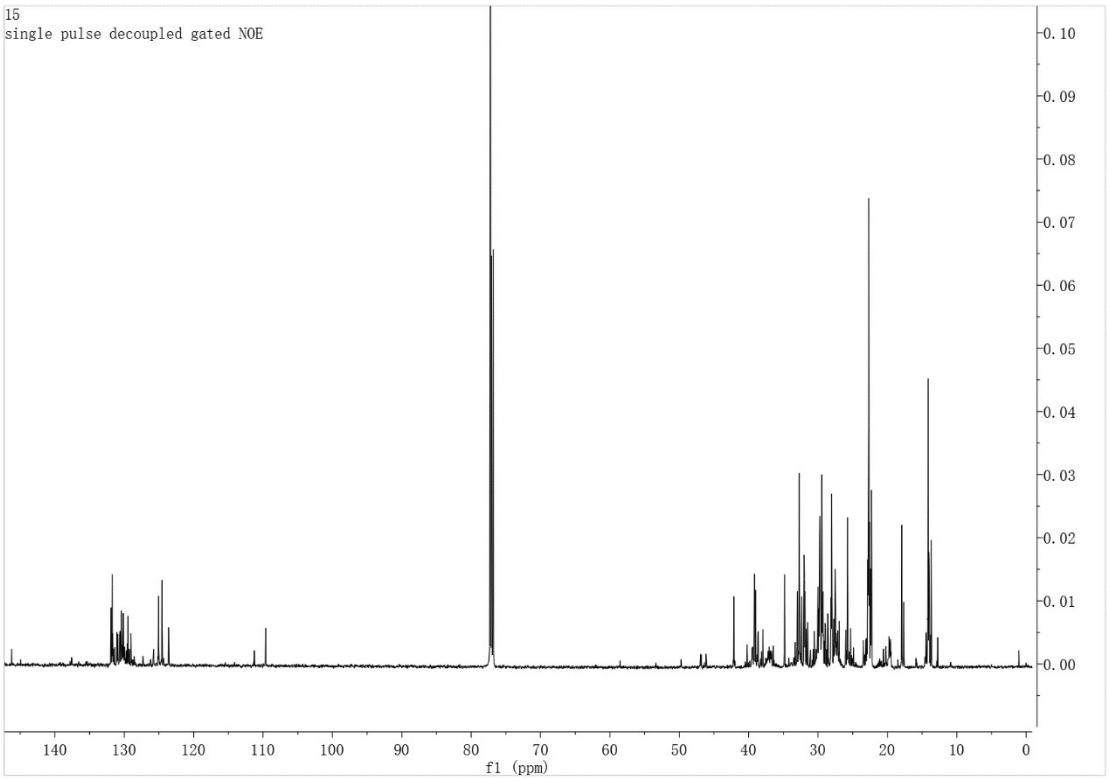


Figure S2. ^{13}C NMR spectrum of the polymer from table 1, entry 1 ($CDCl_3$, 20 °C).

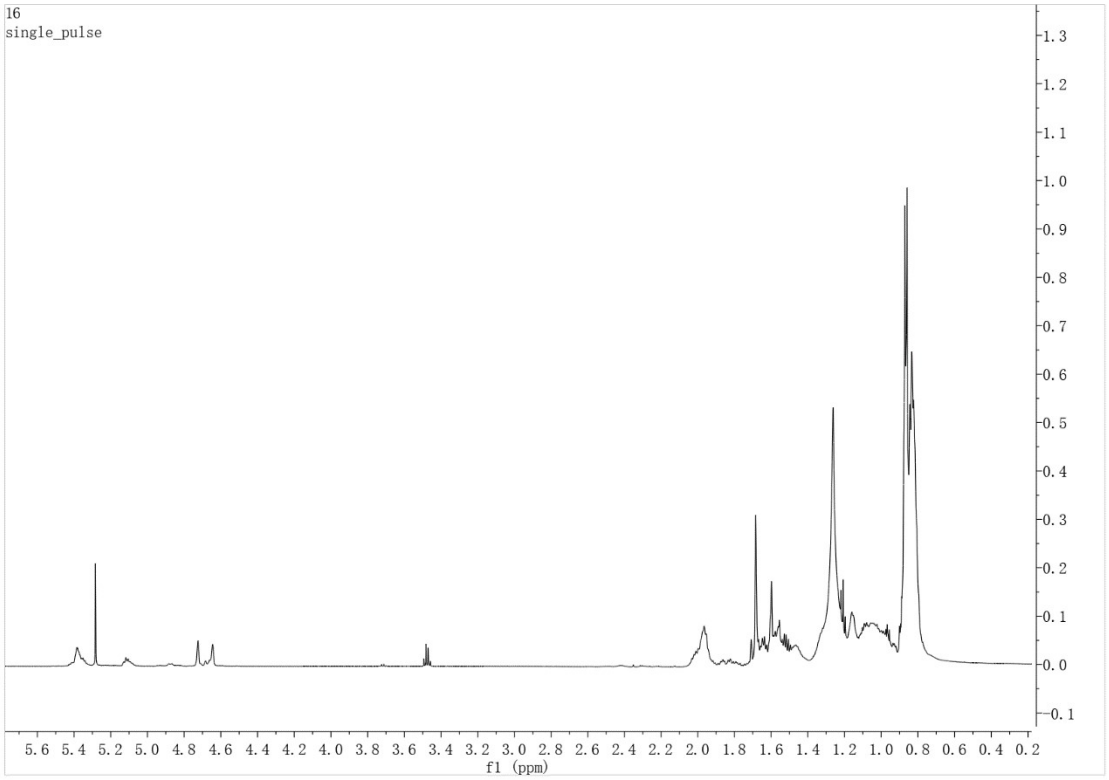


Figure S3. ^{1}H NMR spectrum of the polymer from table 1, entry 3 ($CDCl_3$, 20 ^{o}C).

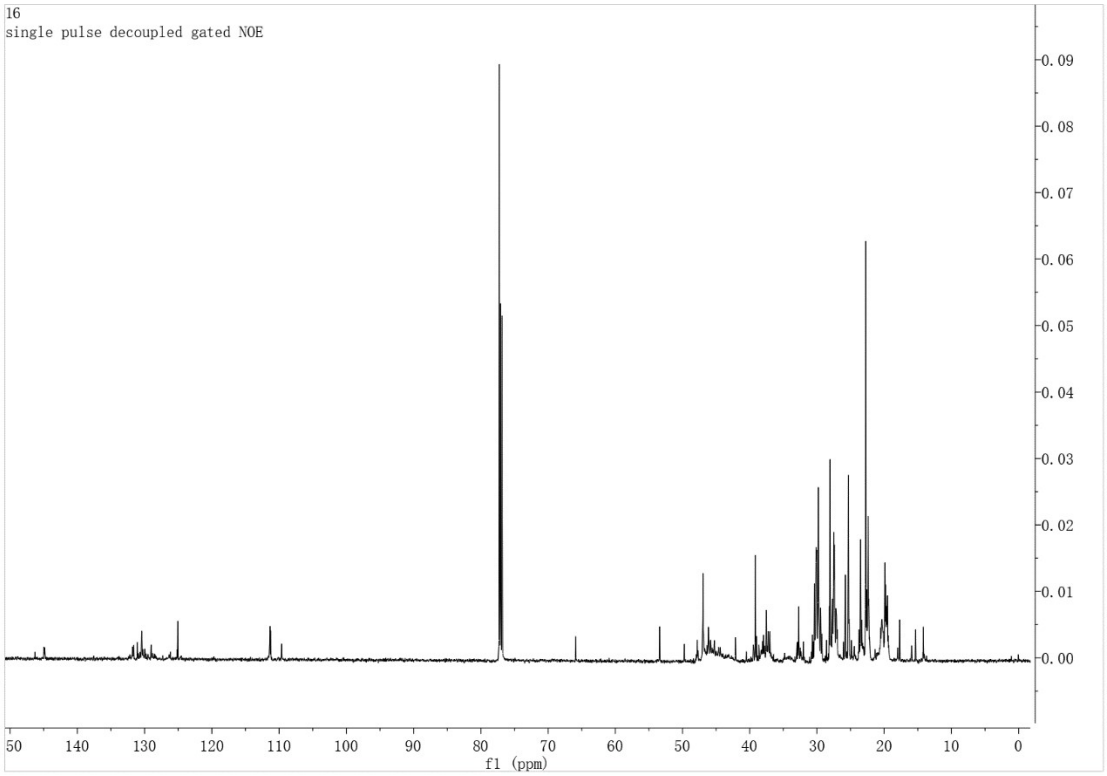


Figure S4. ^{13}C NMR spectrum of the polymer from table 1, entry 3 ($CDCl_3$, 20 ^{o}C).

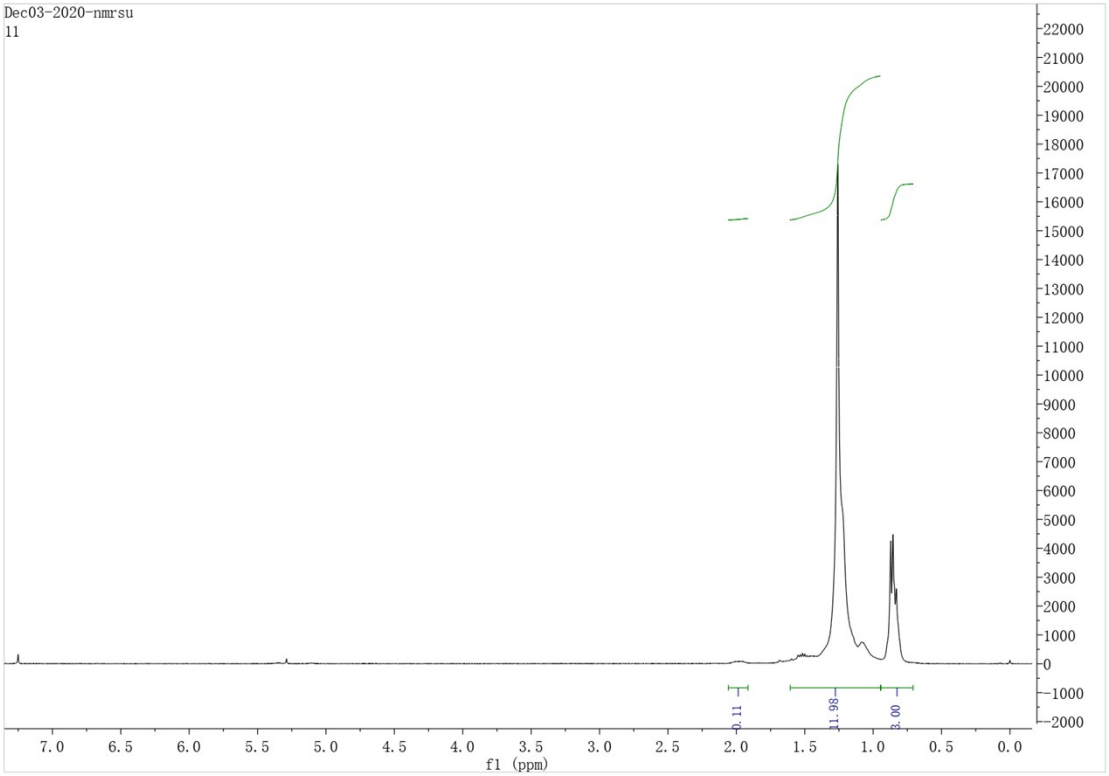


Figure S5. ^{1}H NMR spectrum of the polymer from table 1, entry 5 ($CDCl_3$, 20 °C).

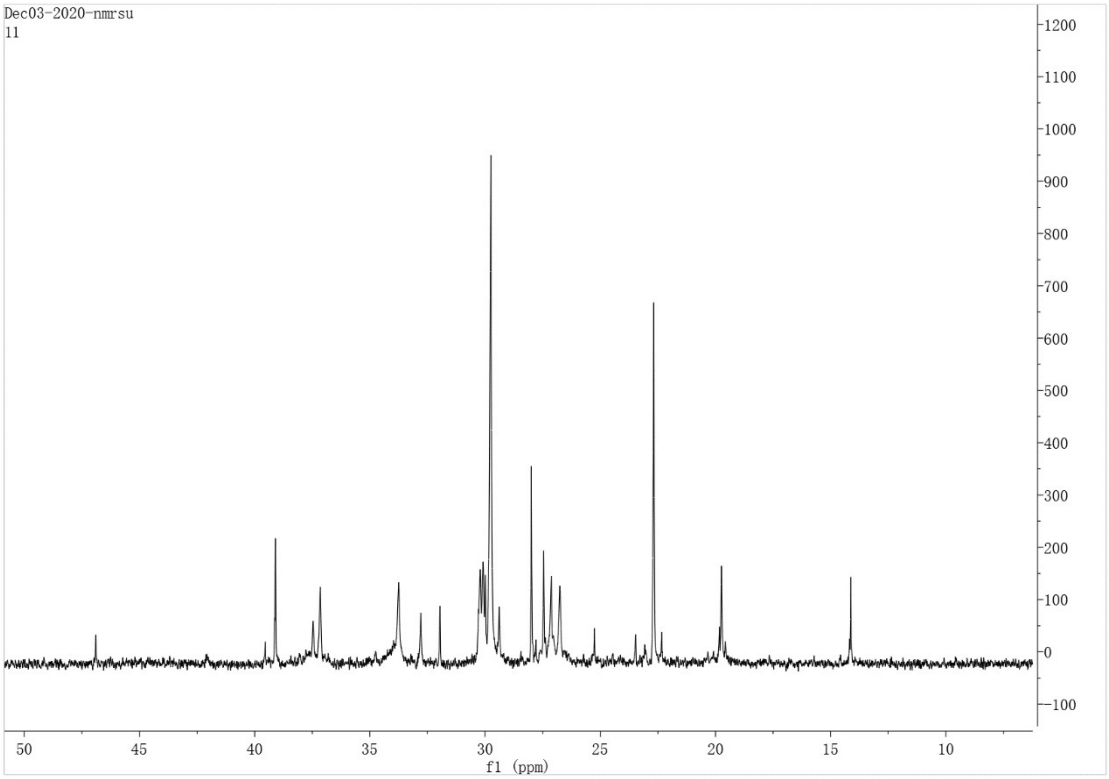


Figure S6. ^{13}C NMR spectrum of the polymer from table 1, entry 5 ($CDCl_3$, 20 °C).

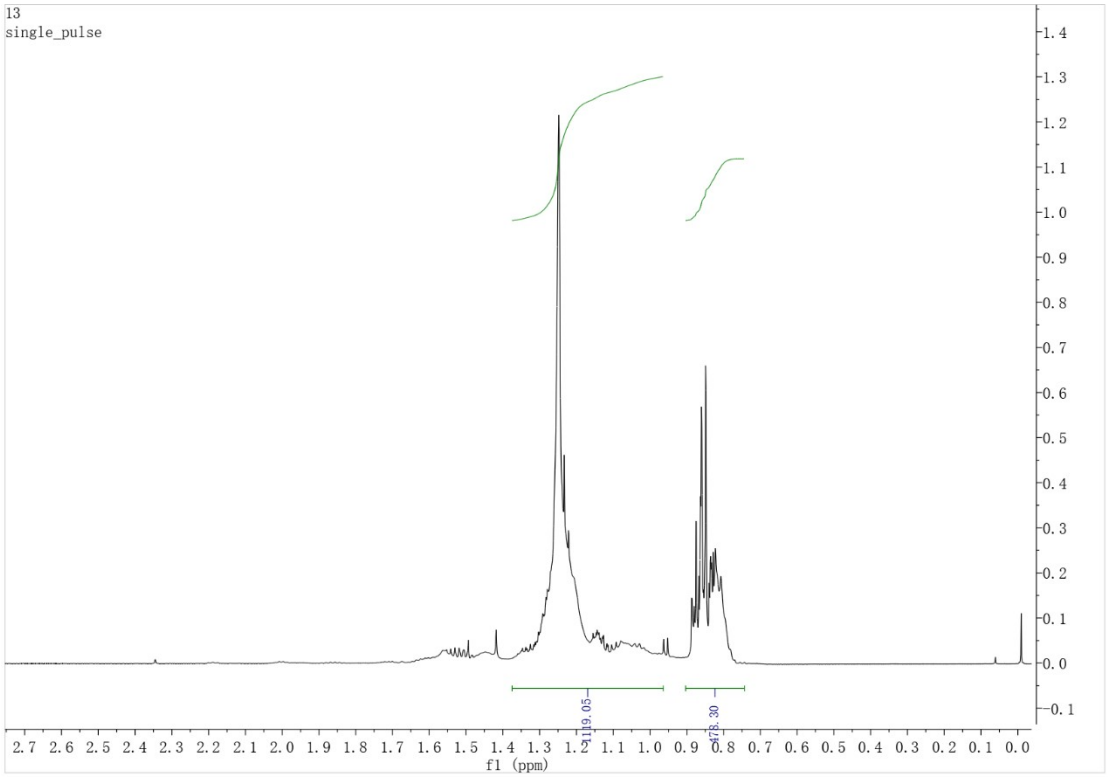


Figure S7. ^{1}H NMR spectrum of the polymer from table 1, entry 7 ($CDCl_3$, 20 °C).

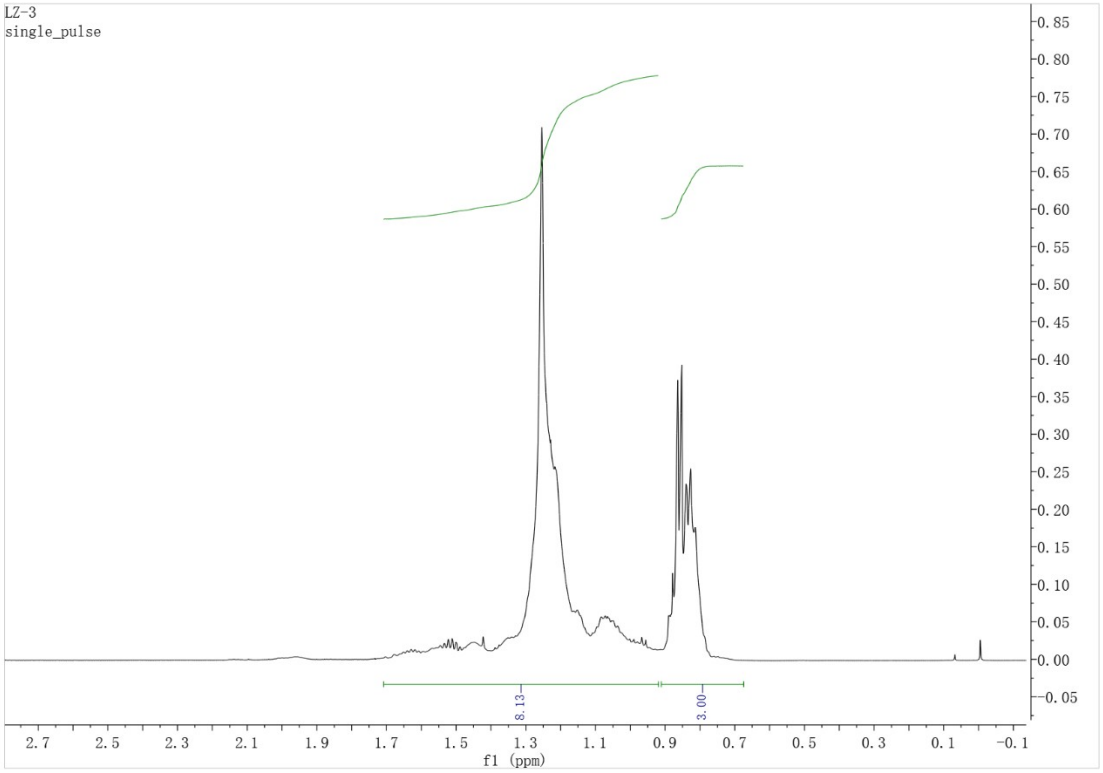


Figure S8. ^{1}H NMR spectrum of the polymer from table 1, entry 11 ($CDCl_3$, 20 °C).

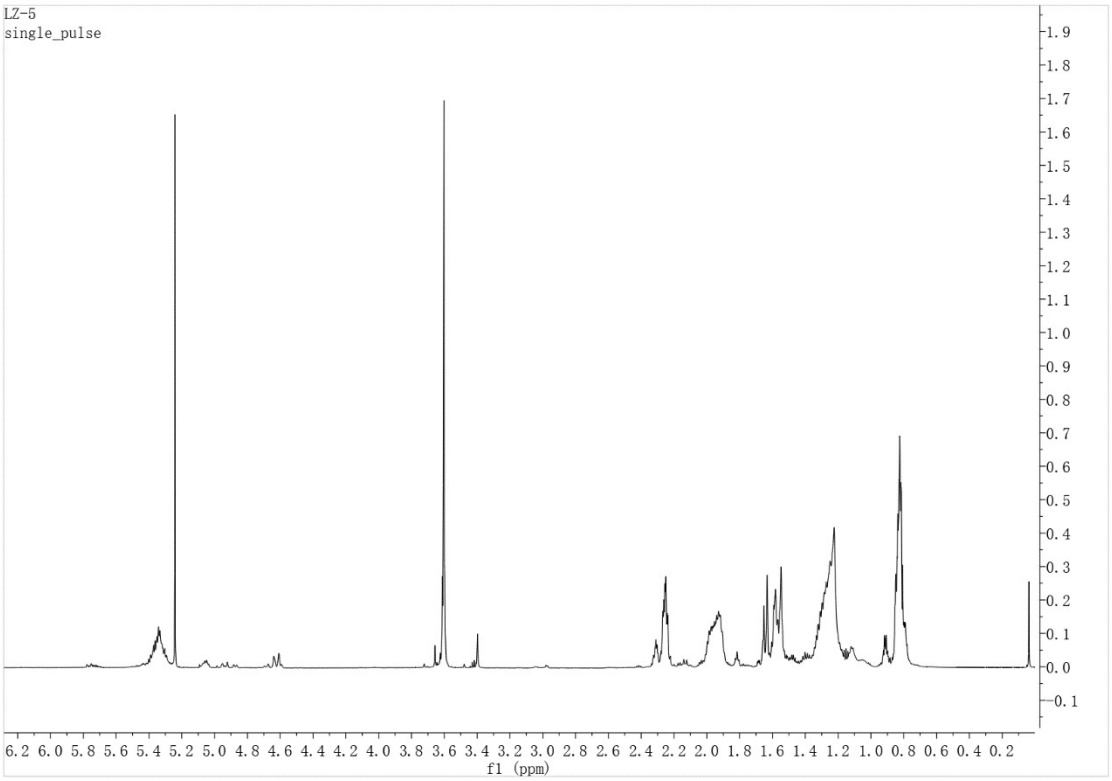


Figure S9. ^{1}H NMR spectrum of the polymer from table 2, entry 1 ($CDCl_3$, 20 °C).

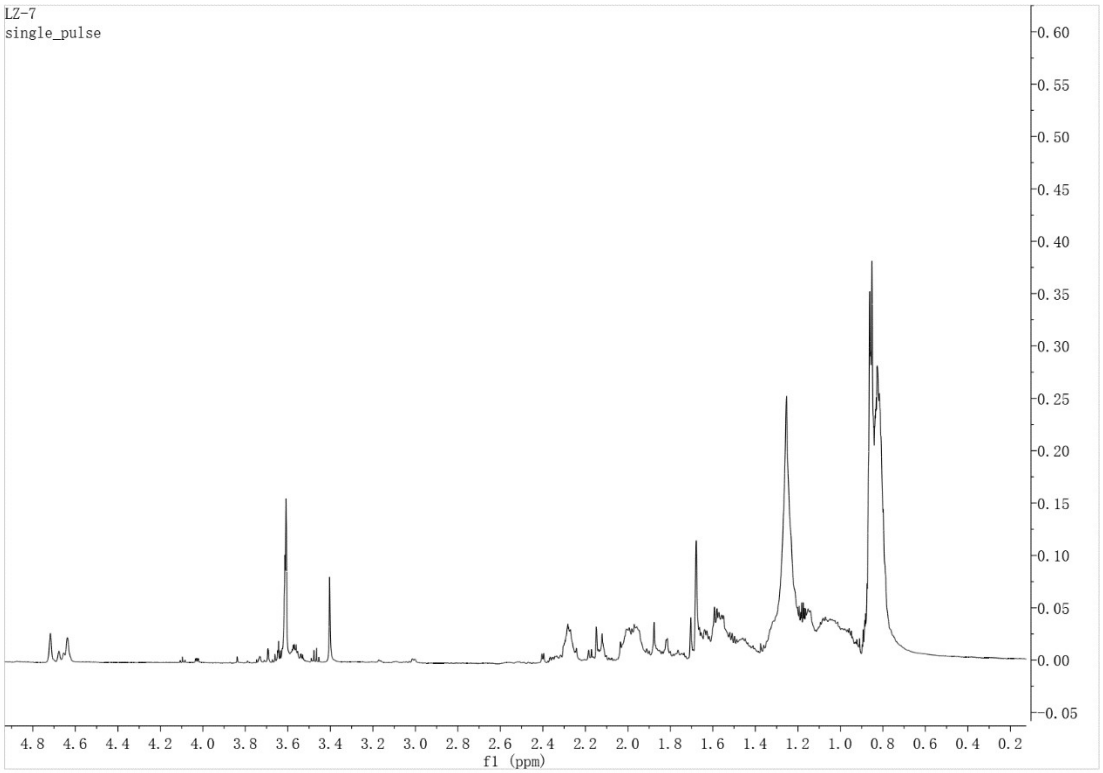


Figure S10. ^{1}H NMR spectrum of the polymer from table 2, entry 3 ($CDCl_3$, 20 °C).

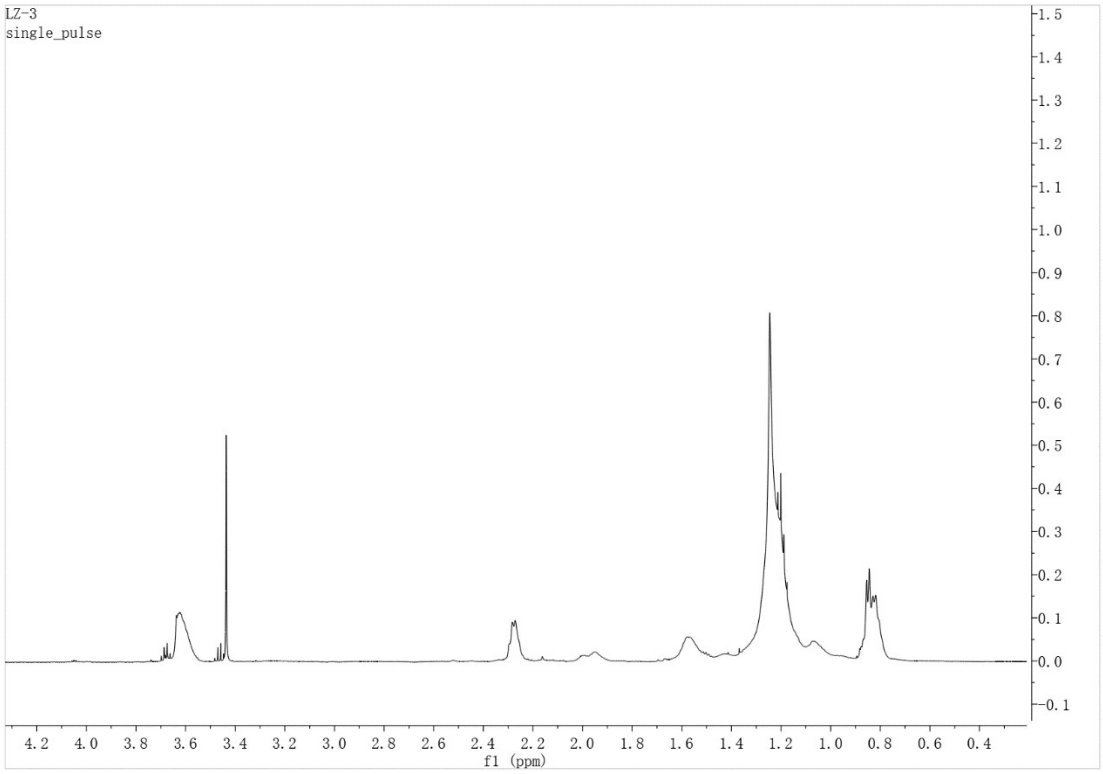


Figure S11. ^{1}H NMR spectrum of the polymer from table 2, entry 5 ($CDCl_3$, 20 °C).

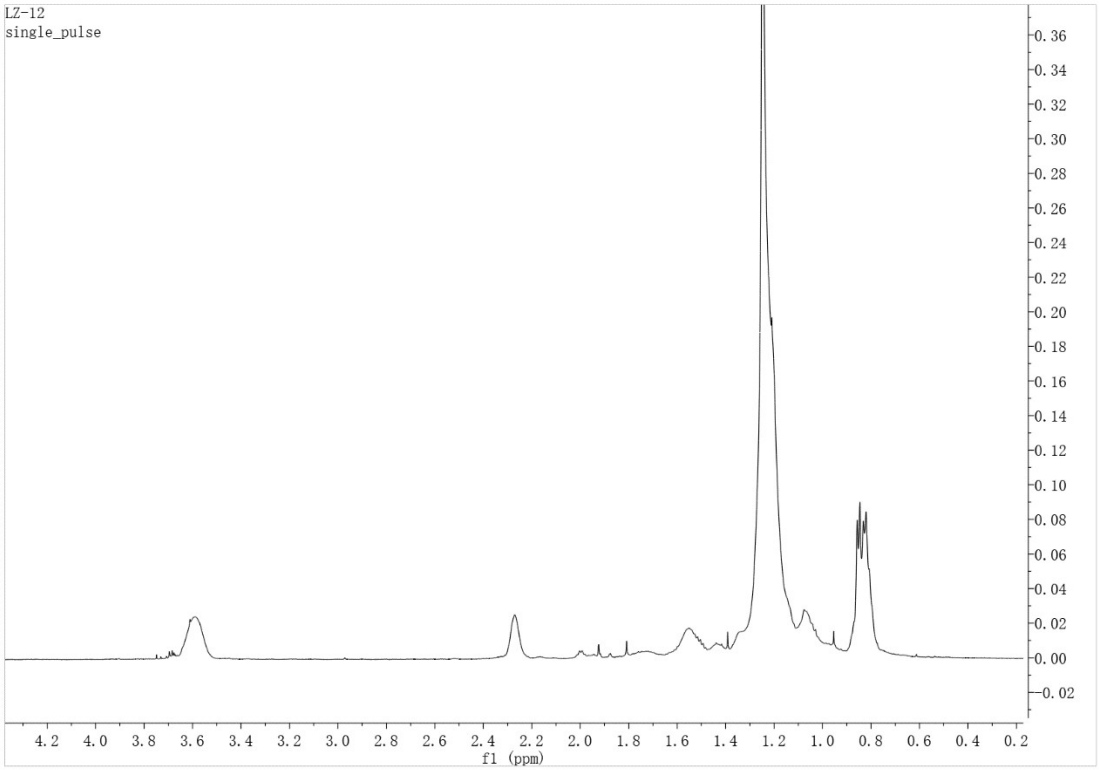


Figure S12. ^{1}H NMR spectrum of the polymer from table 2, entry 9 ($CDCl_3$, 20 °C).

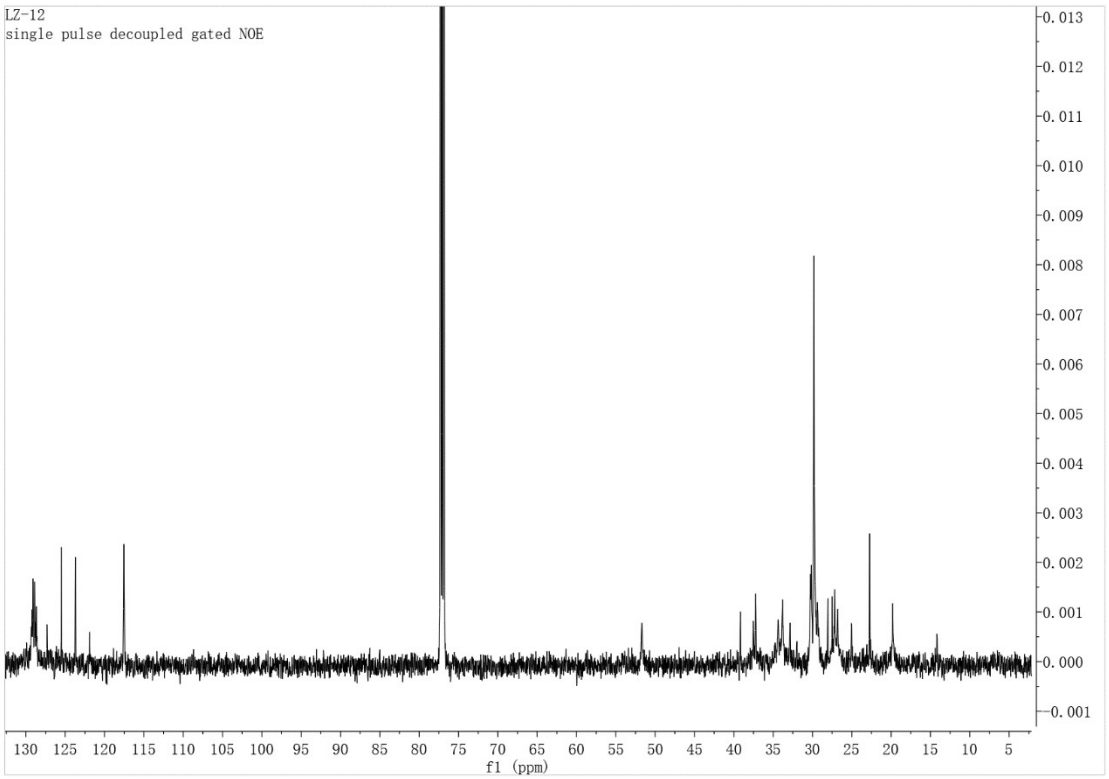


Figure S13. ^{13}C NMR spectrum of the polymer from table 2, entry 9 ($CDCl_3$, 20 °C).

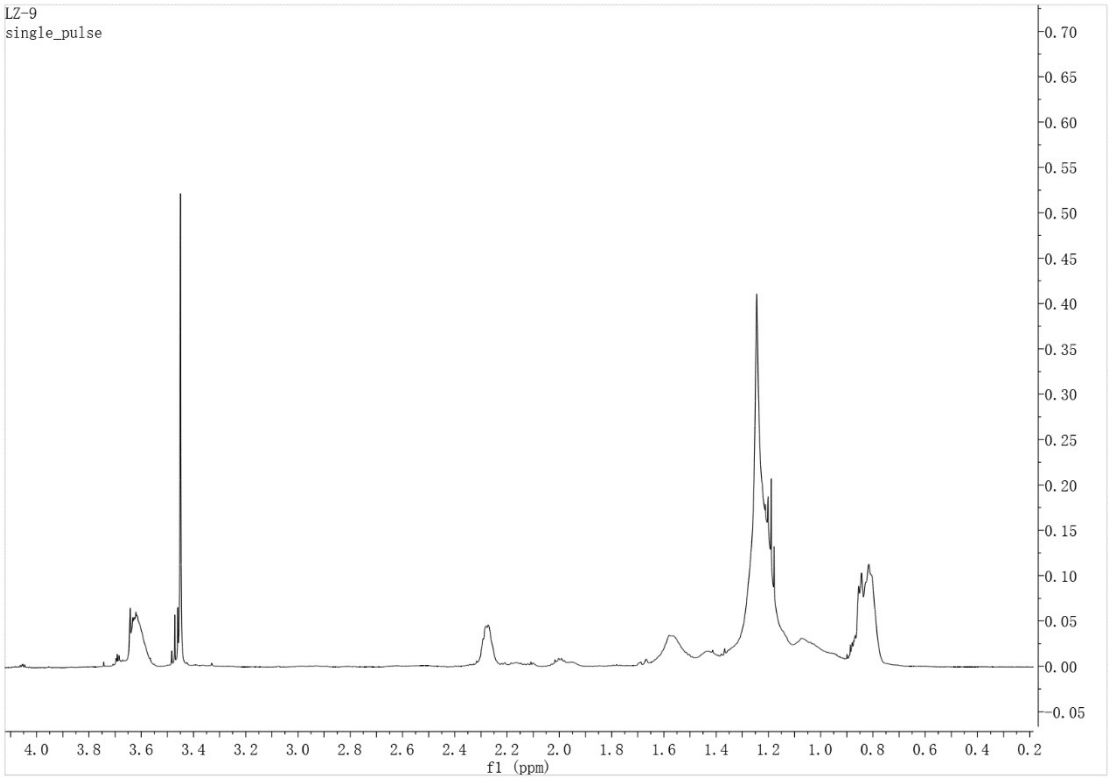


Figure S14. ^{1}H NMR spectrum of the polymer from table 2, entry 11 ($CDCl_3$, 20 °C).

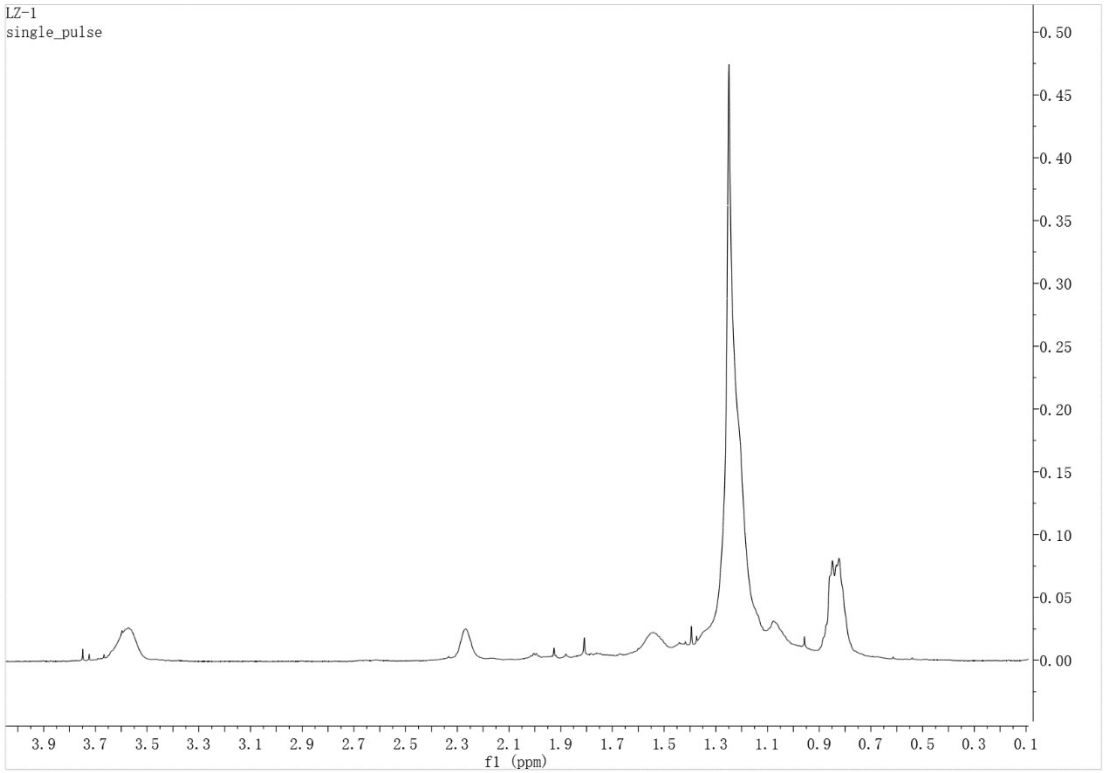


Figure S15. ^{1}H NMR spectrum of the polymer from table 2, entry 15 ($CDCl_3$, 20 ^{o}C).

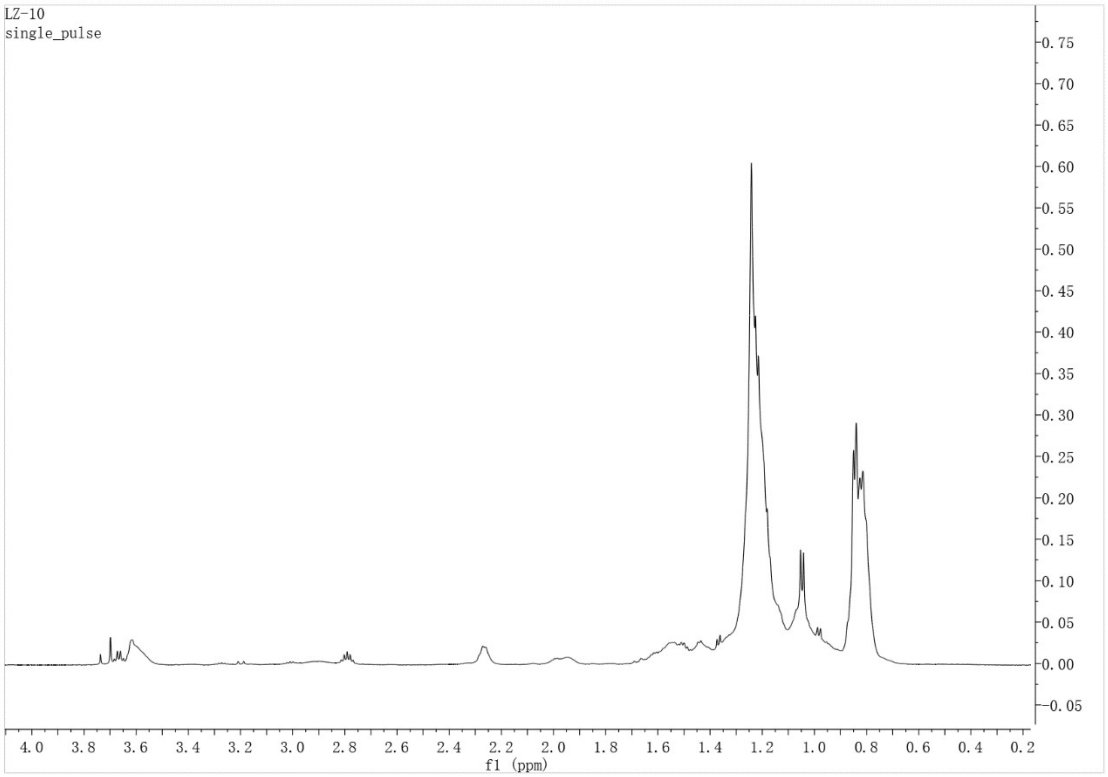


Figure S16. ^{1}H NMR spectrum of the polymer from table 2, entry 24 ($CDCl_3$, 20 ^{o}C).

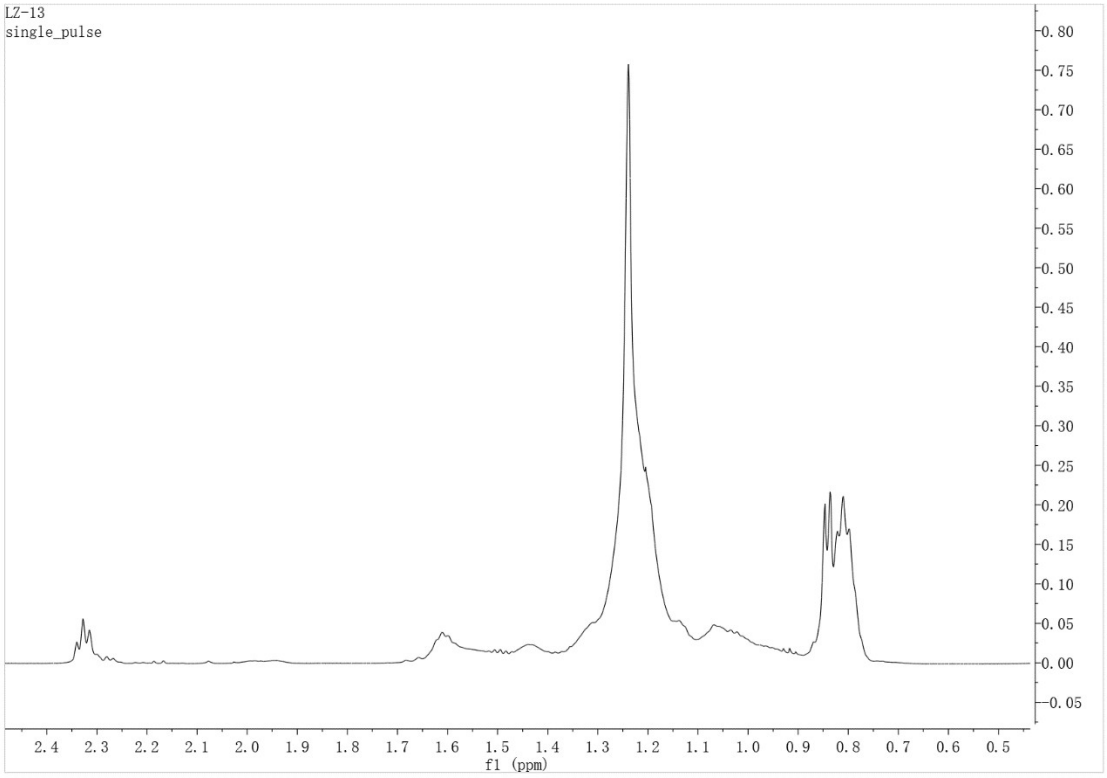


Figure S17. ^{1}H NMR spectrum of the polymer from table 3, entry 1 ($CDCl_3$, 20 ^{o}C).

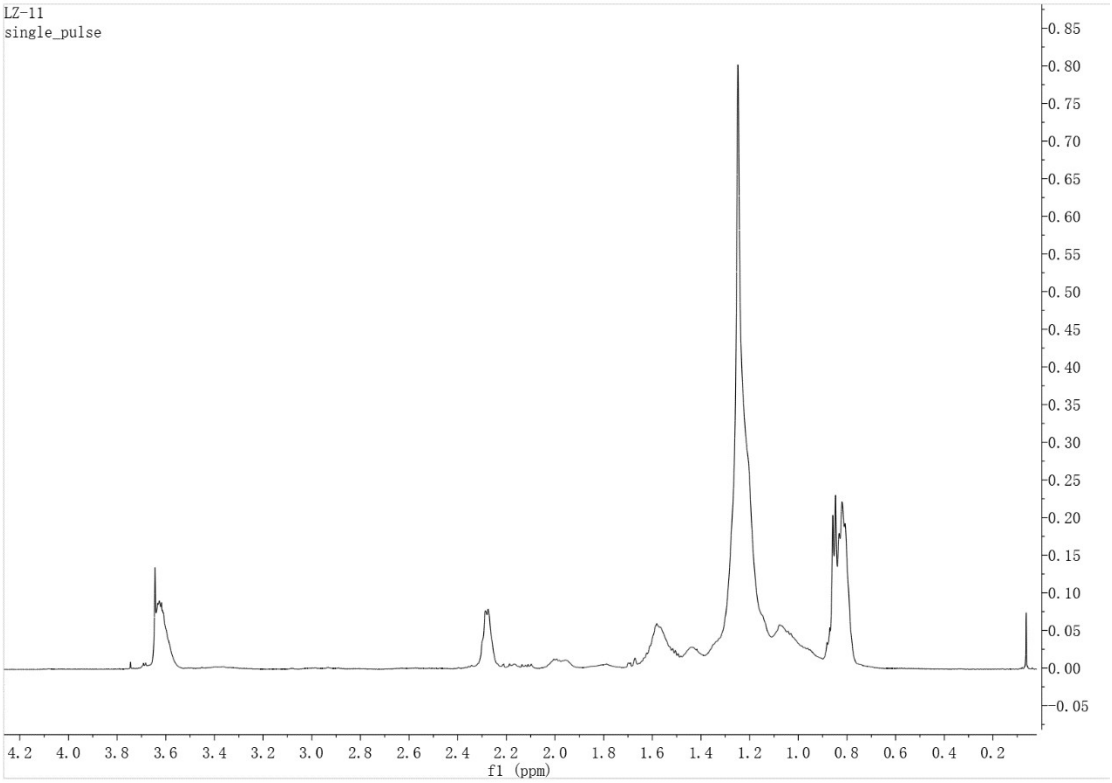


Figure S18. ^{1}H NMR spectrum of the polymer from table 3, entry 6 ($CDCl_3$, 20 ^{o}C).

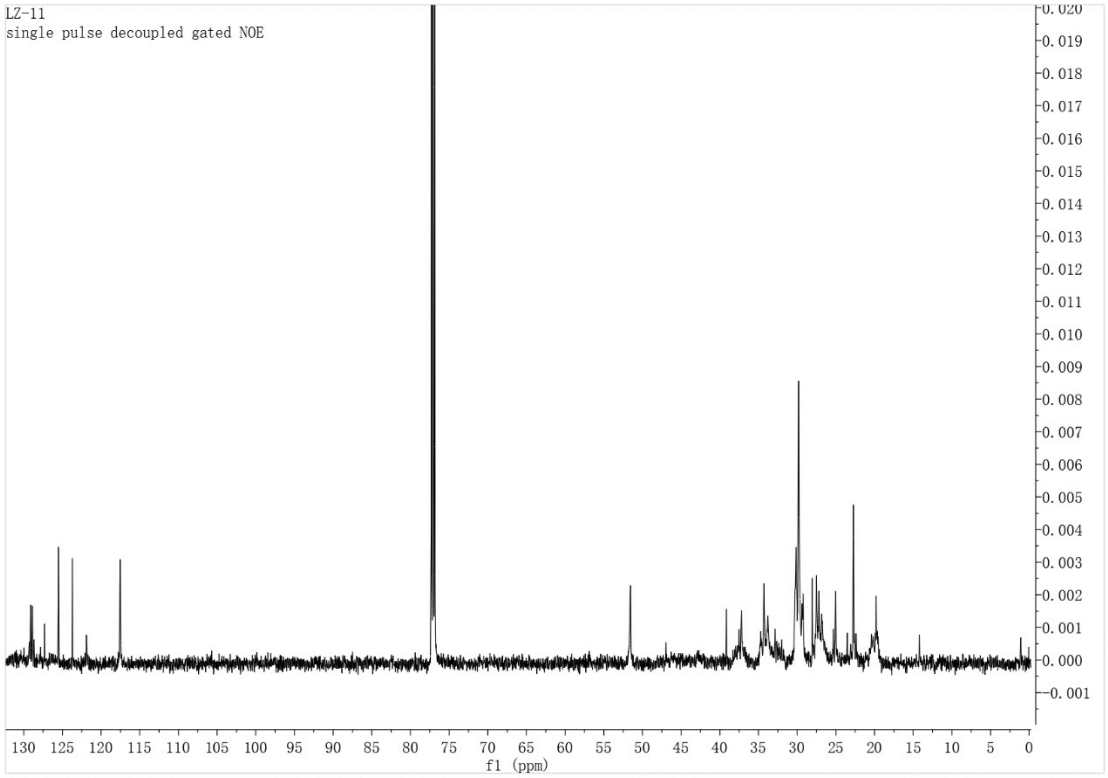
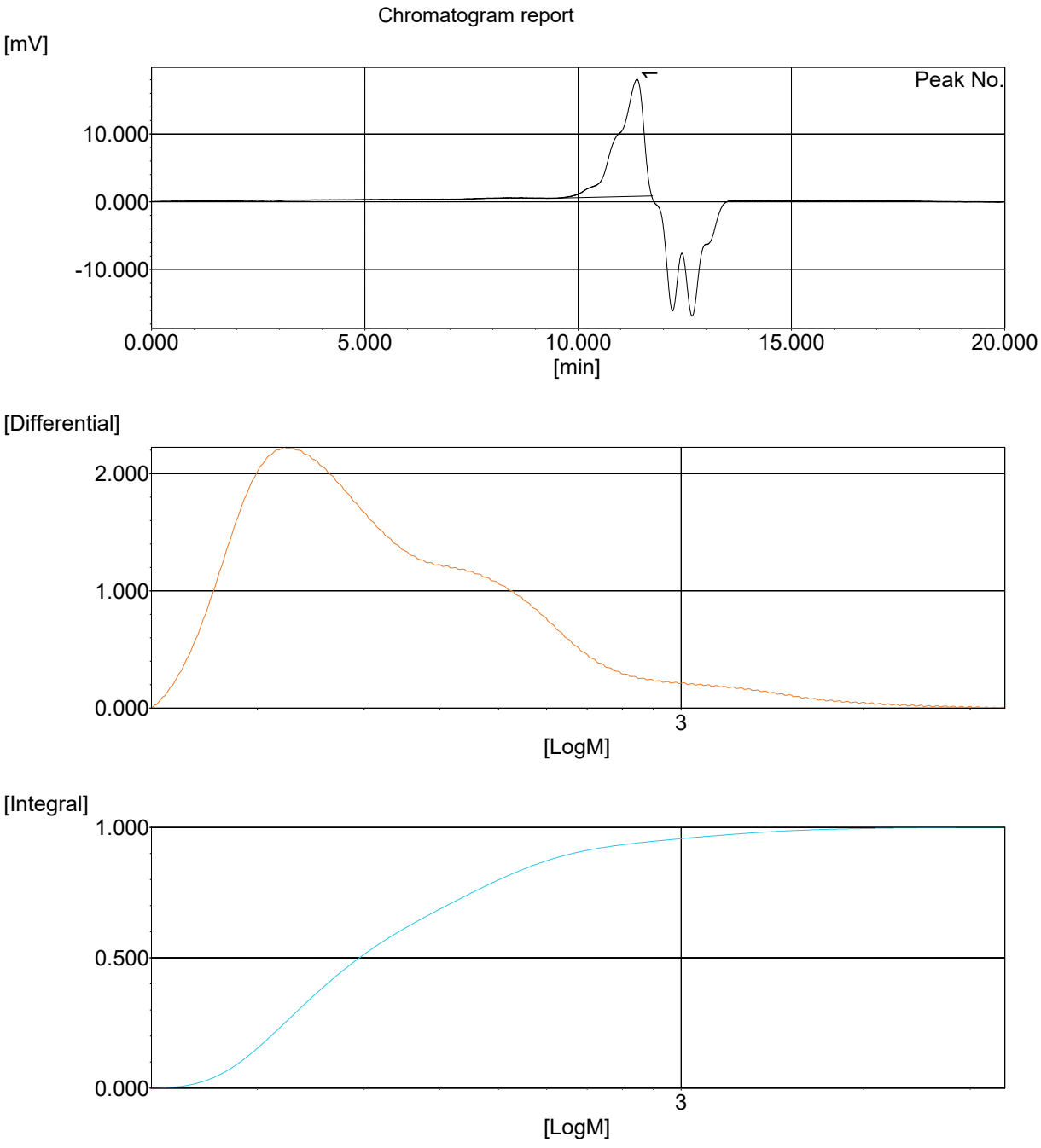


Figure S19. ^{13}C NMR spectrum of the polymer from table 3, entry 6 ($CDCl_3$, 20 °C).

1.2 GPC, DSC of Some Representative Polymers.



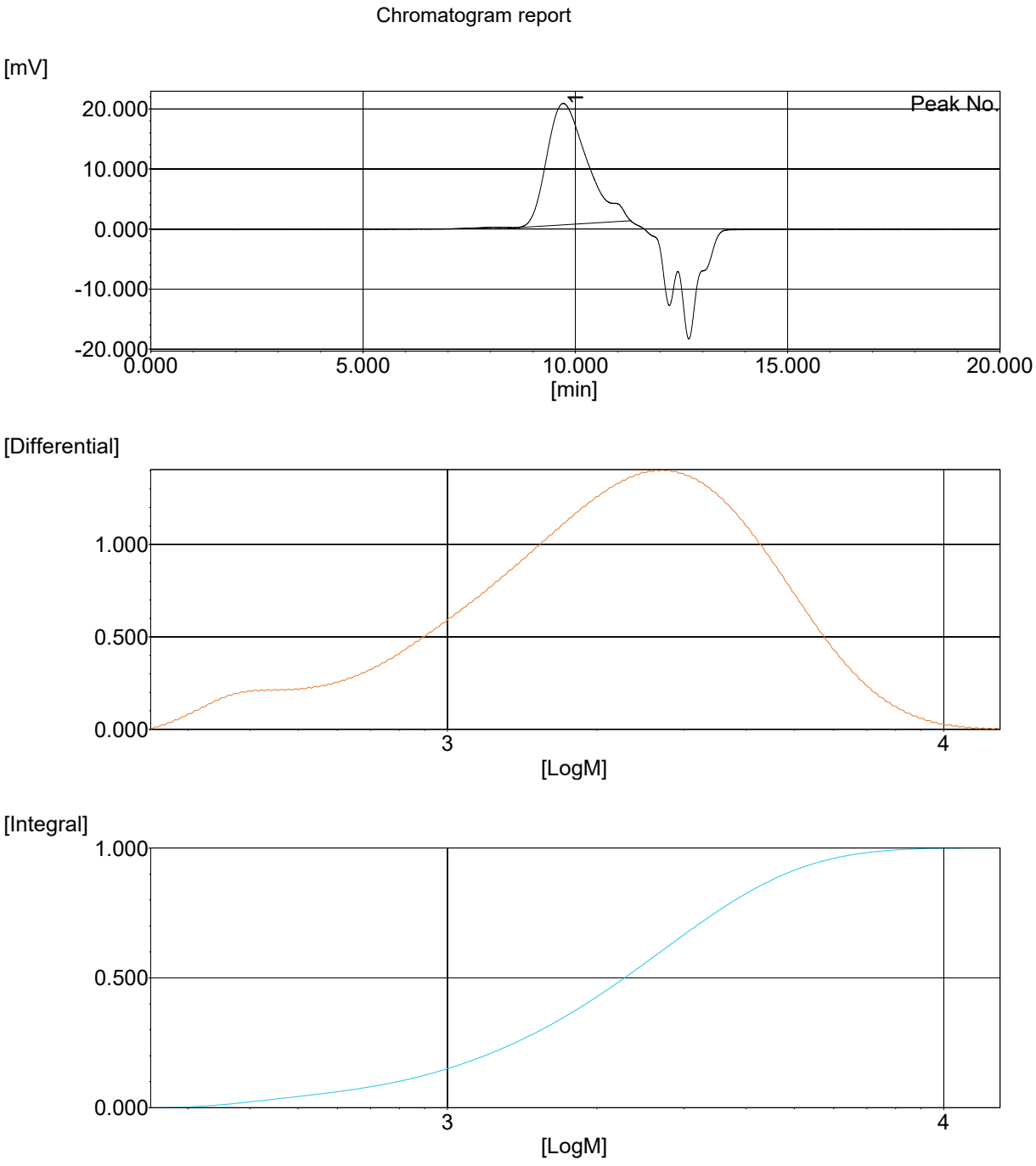
Result of molecular weight calculation (RI)

Peak 1 Base Peak

	[min]	[mV]	[mol]
Peak start	9.553	0.544	3,419
Peak top	11.385	18.068	221
Peak end	11.723	0.871	133
Height [mV]			17.248
Area [mV*sec]			717.685
Area% [%]			100.000
[eta]			389.56427

Mn	294
Mw	390
Mz	601
Mz+1	998
Mv	390
Mp	222
Mz/Mw	1.544
Mw/Mn	1.323
Mz+1/Mw	2.563

Figure S20. GPC of the polymer from table 1, entry 2.

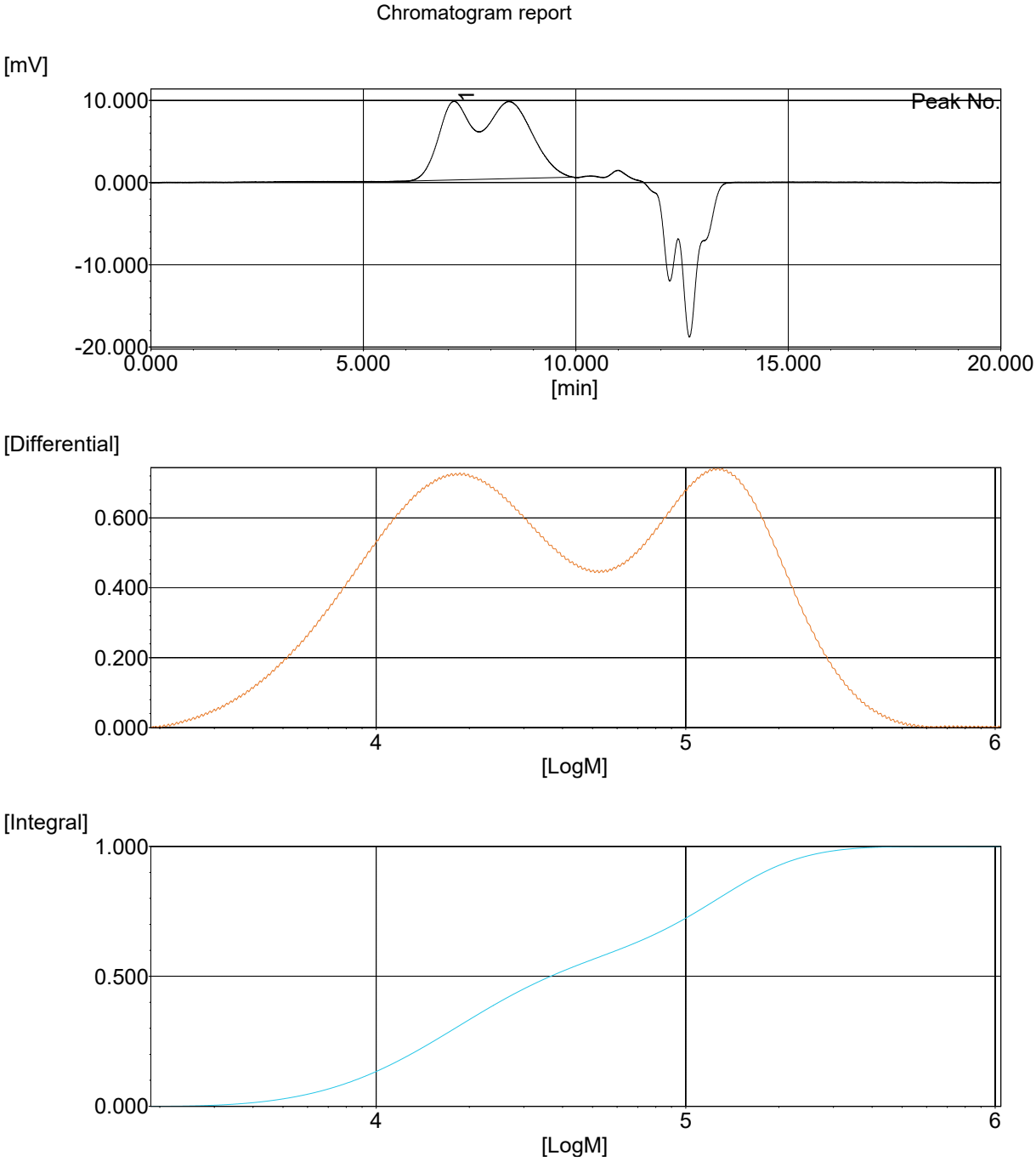


Result of molecular weight calculation (RI)

Peak 1 Base Peak

	[min]	[mV]	[mol]		
Peak start	8.660	0.243	12,979	Mn	1,596
Peak top	9.708	20.959	2,712	Mw	2,588
Peak end	11.298	1.373	252	Mz	3,613
				Mz+1	4,586
				Mv	2,588
Height [mV]			20.267	Mp	2,713
Area [mV*sec]			1335.072	Mz/Mw	1.396
Area% [%]			100.000	Mw/Mn	1.622
[eta]			2588.06538	Mz+1/Mw	1.772

Figure S21. GPC of the polymer from table 1, entry 6.

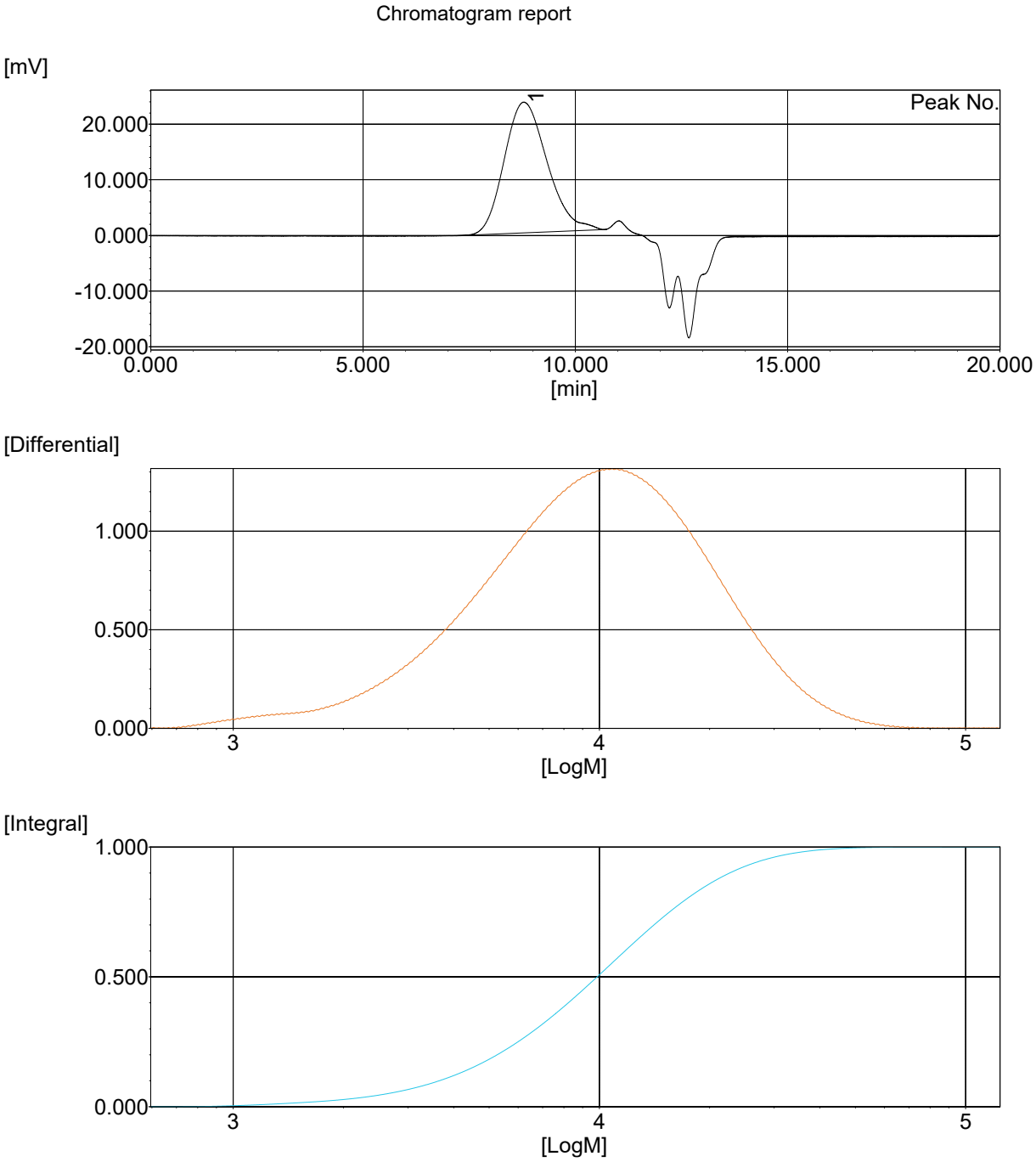


Result of molecular weight calculation (RI)

Peak 1 Base Peak

	[min]	[mV]	[mol]		
Peak start	5.723	0.154	1,041,811	Mn	20,852
Peak top	7.130	9.934	127,502	Mw	71,390
Peak end	9.957	0.659	1,872	Mz	156,830
				Mz+1	235,307
				Mv	71,390
Height [mV]			9.612	Mp	127,503
Area [mV*sec]			1196.147	Mz/Mw	2.197
Area% [%]			100.000	Mw/Mn	3.424
[eta]			71389.68463	Mz+1/Mw	3.296

Figure S22. GPC of the polymer from table 1, entry 7.

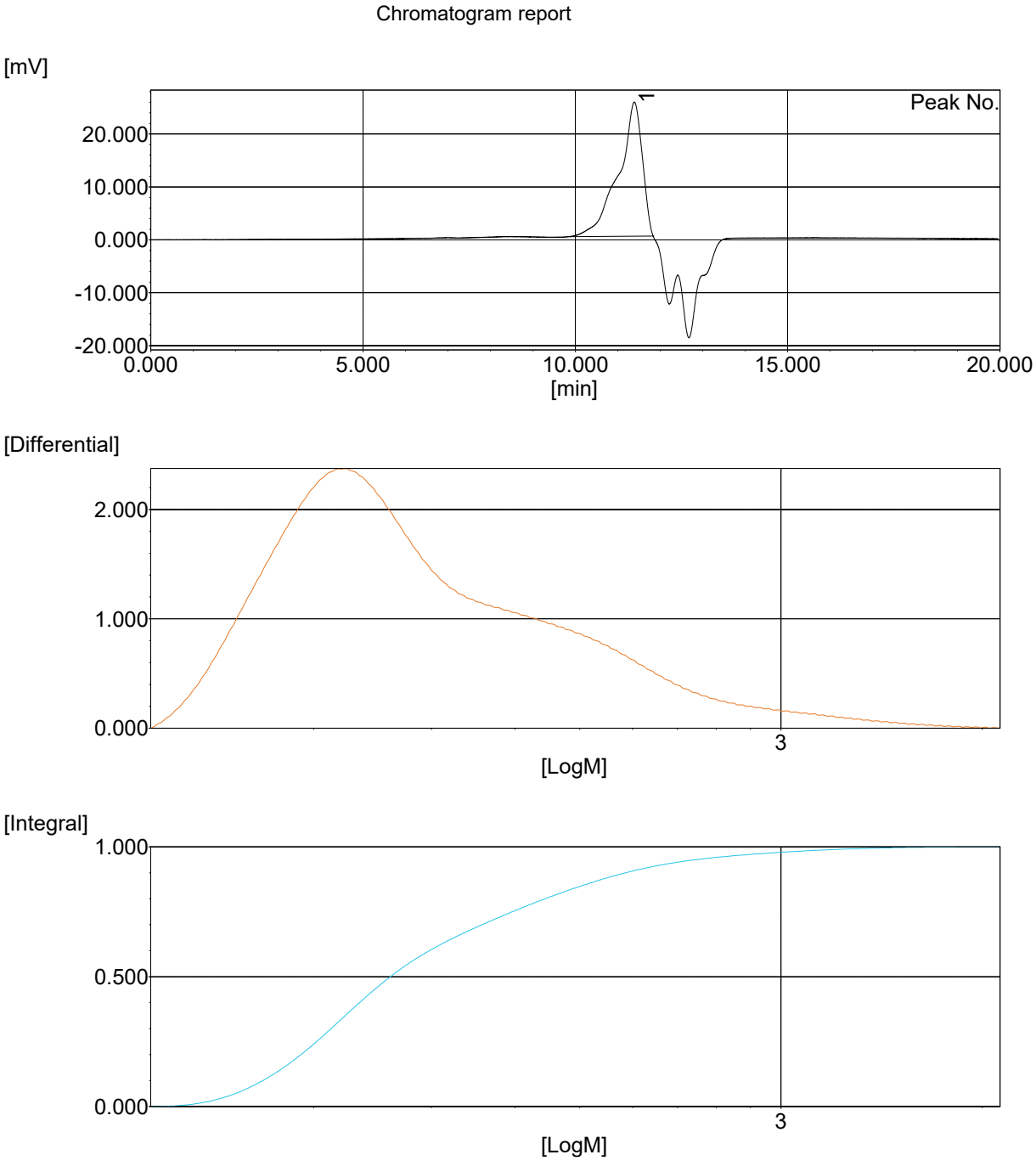


Result of molecular weight calculation (RI)

Peak 1 Base Peak

	[min]	[mV]	[mol]		
Peak start	7.148	-0.055	124,059	Mn	7,030
Peak top	8.780	23.980	10,850	Mw	11,893
Peak end	10.723	1.066	595	Mz	17,841
				Mz+1	25,139
				Mv	11,893
Height [mV]			23.523	Mp	10,850
Area [mV*sec]			1652.367	Mz/Mw	1.500
Area% [%]			100.000	Mw/Mn	1.692
[eta]			11892.84336	Mz+1/Mw	2.114

Figure S23. GPC of the polymer from table 1, entry 11.



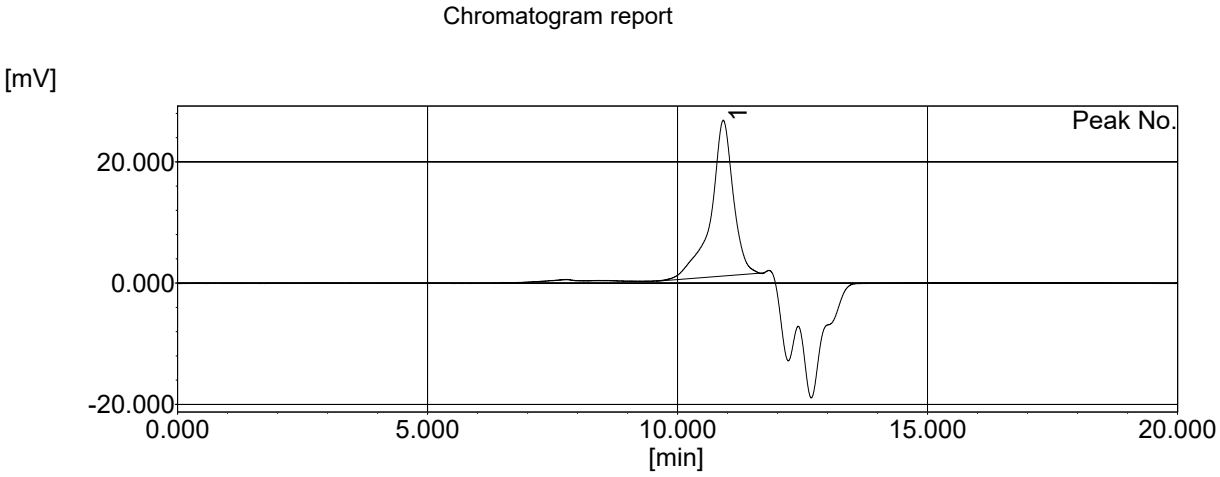
Result of molecular weight calculation (RI)

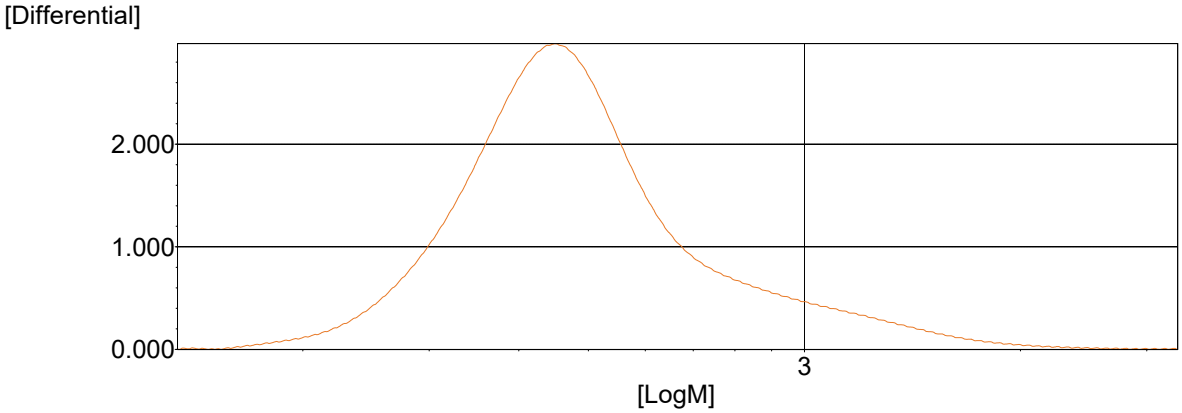
Peak 1 Base Peak

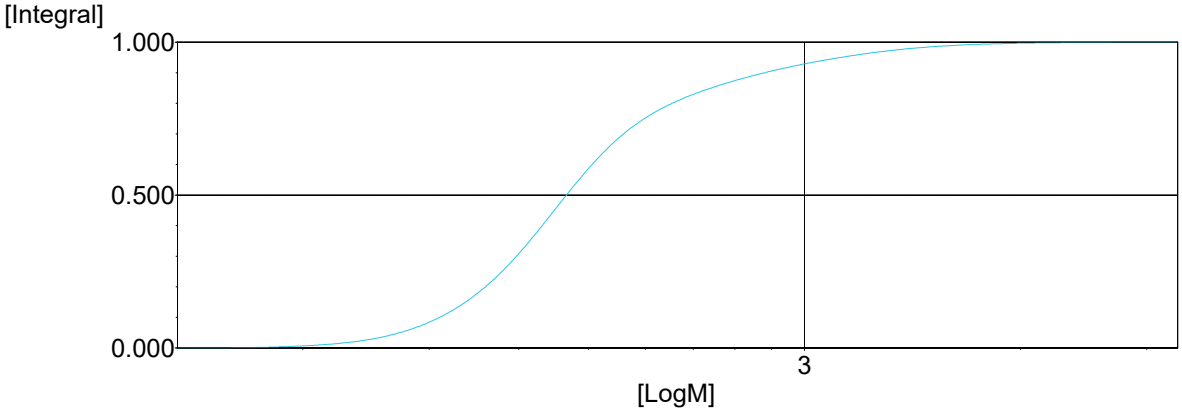
	[min]	[mV]	[mol]
Peak start	9.872	0.609	2,125
Peak top	11.380	26.055	223
Peak end	11.830	0.714	114
Height [mV]			25.365
Area [mV*sec]			988.095
Area% [%]			100.000
[eta]			334.43446

Mn	262
Mw	334
Mz	469
Mz+1	682
Mv	334
Mp	223
Mz/Mw	1.404
Mw/Mn	1.279
Mz+1/Mw	2.039

Figure S24. GPC of the polymer from table 2, entry 1.







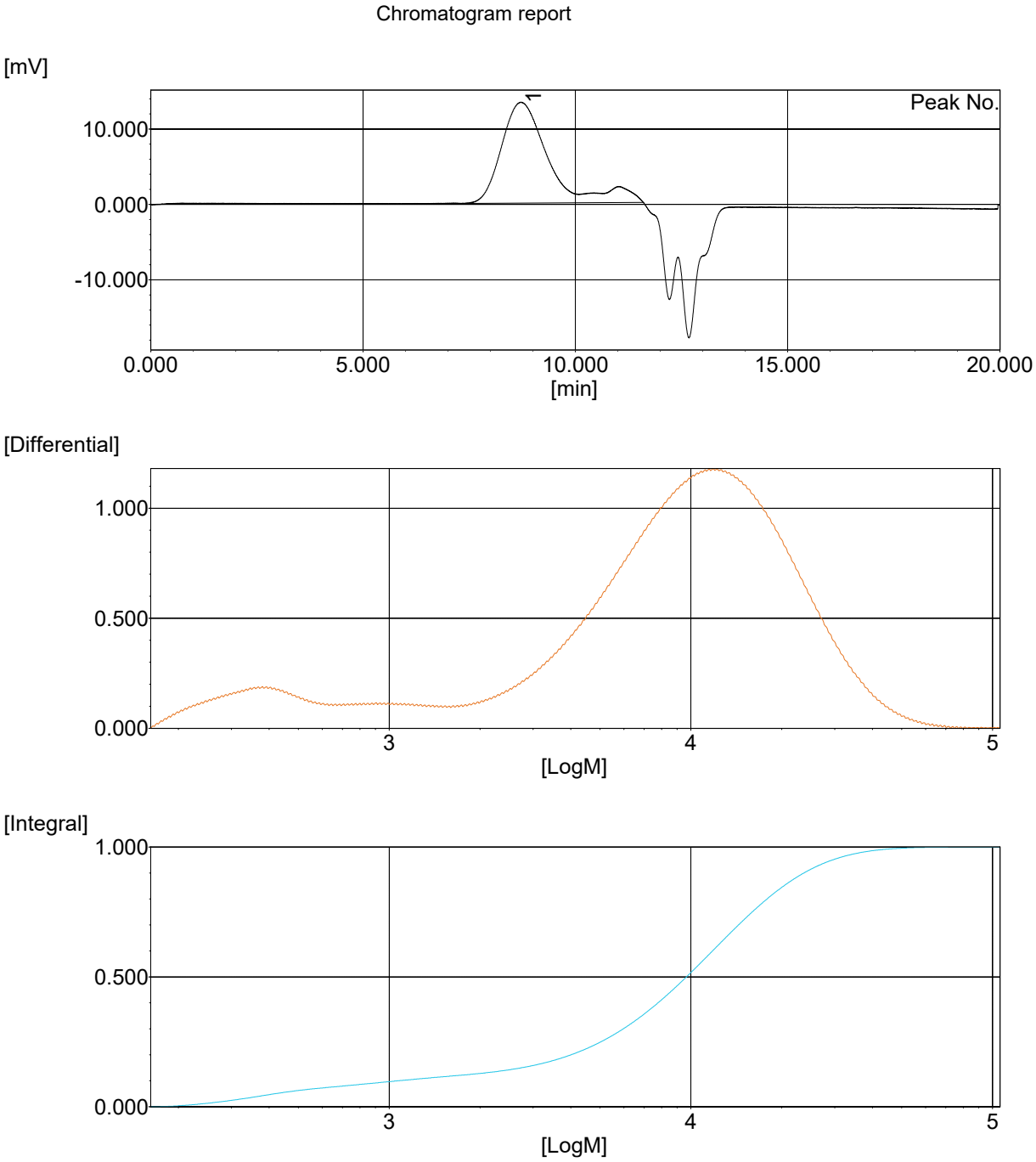
Result of molecular weight calculation (RI)

Peak 1 Base Peak

	[min]	[mV]	[mol]
Peak start	9.575	0.318	3,310
Peak top	10.912	26.895	449
Peak end	11.723	1.693	133
Height [mV]			25.721
Area [mV*sec]			798.541
Area% [%]			100.000
[eta]			542.31805

Mn	455
Mw	542
Mz	687
Mz+1	922
Mv	542
Mp	450
Mz/Mw	1.268
Mw/Mn	1.191
Mz+1/Mw	1.700

Figure S25. GPC of the polymer from table 2, entry 3.

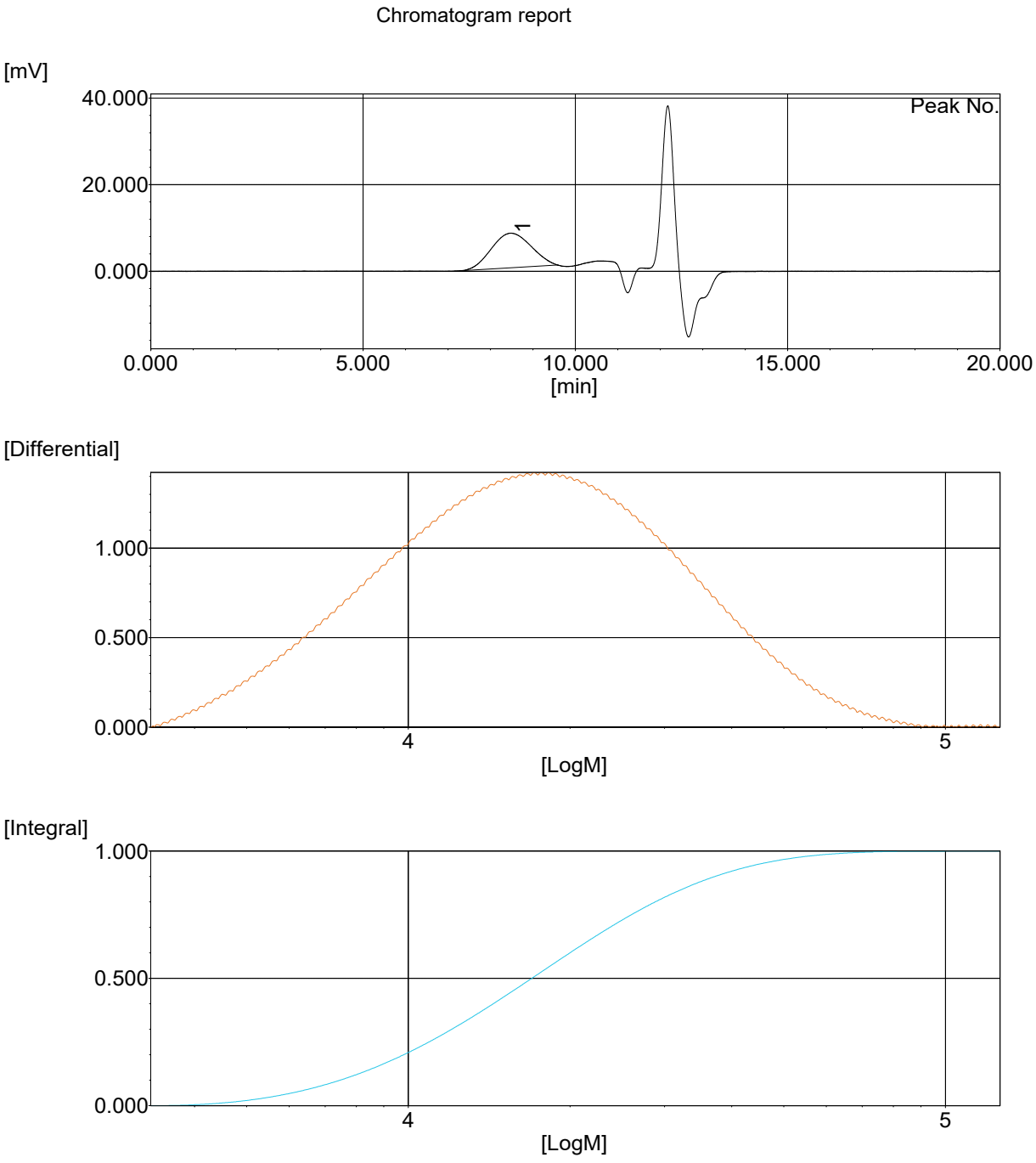


Result of molecular weight calculation (RI)

Peak 1 Base Peak

	[min]	[mV]	[mol]		
Peak start	7.255	0.128	105,792	Mn	2,650
Peak top	8.720	13.584	11,867	Mw	11,600
Peak end	11.595	0.270	162	Mz	19,175
				Mz+1	26,641
				Mv	11,600
Height [mV]			13.408	Mp	11,867
Area [mV*sec]			1051.528	Mz/Mw	1.653
Area% [%]			100.000	Mw/Mn	4.377
[eta]			11600.36473	Mz+1/Mw	2.297

Figure S26. GPC of the polymer from table 2, entry 7.



Result of molecular weight calculation (RI)

Peak 1 Base Peak

	[min]	[mV]	[mol]		
Peak start	7.153	0.021	126,317	Mn	14,028
Peak top	8.465	8.804	17,681	Mw	20,180
Peak end	9.582	1.442	3,315	Mz	28,223
				Mz+1	37,395
				Mv	20,180
Height [mV]			8.015	Mp	17,682
Area [mV*sec]			519.520	Mz/Mw	1.399
Area% [%]			100.000	Mw/Mn	1.439
[eta]			20179.85866	Mz+1/Mw	1.853

Figure S27. GPC of the polymer from table 3, entry 3.

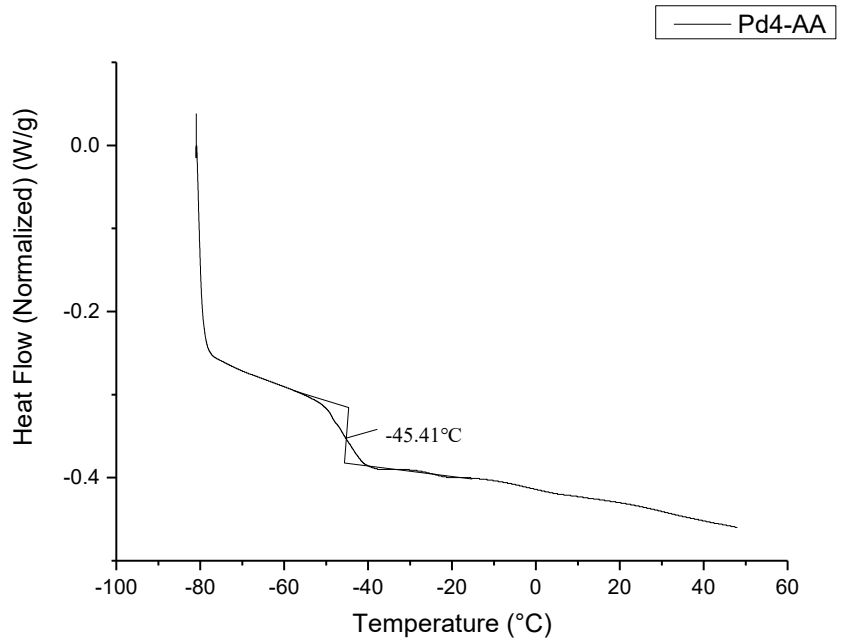


Figure S28. DSC of the polymer from table 3, entry 1.

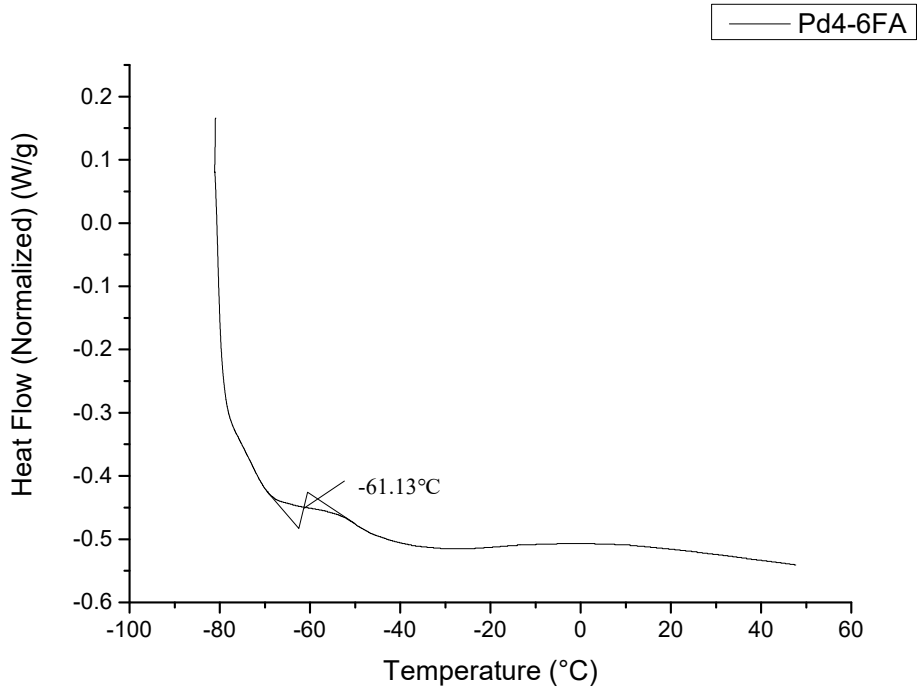


Figure S29. DSC of the polymer from table 3, entry 3.

1.3 WCA of Some Representative Polymers.

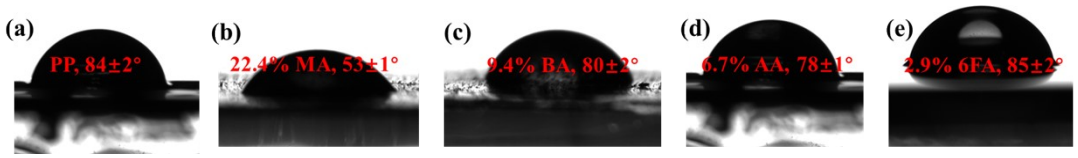


Figure S30. Water contact angle of the polypropylene **(a)** (sample from Table 1, entry 7), P-**MA** copolymer **(b)** (sample from Table 2, entry 12), P-**BA** copolymer **(c)** (sample from Table 3, entry 2), P-**AA** copolymer **(d)** (sample from Table 3, entry 1) and P-**6FA** copolymer **(e)** (sample from Table 3, entry 3).