

Terpolymerization of ethylene, norbornene and dicyclopentadiene catalyzed by modified cyclopentadienyl scandium complexes

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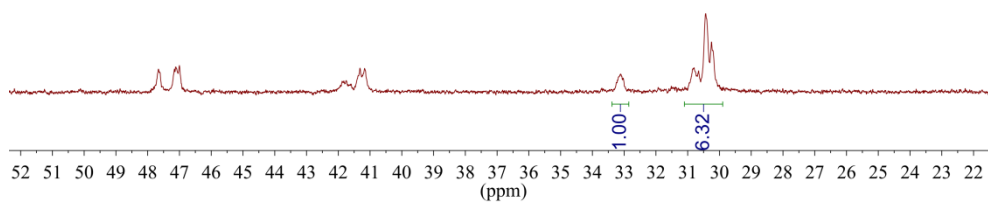


Fig. S1 ¹³C NMR spectrum of ethylene/norbornene copolymer (Table 1, entry 1, C₆D₄Cl₂, 110 °C, 400 MHz).

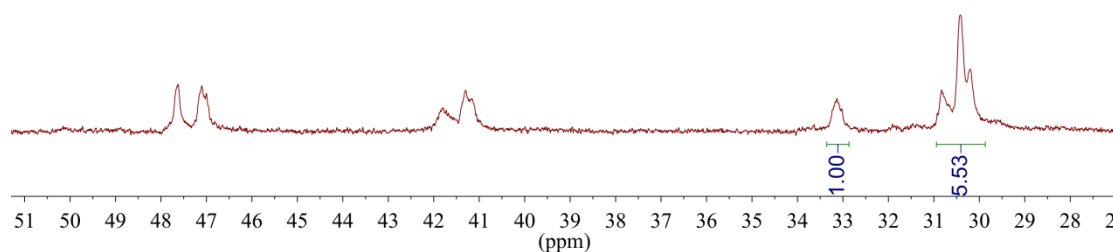


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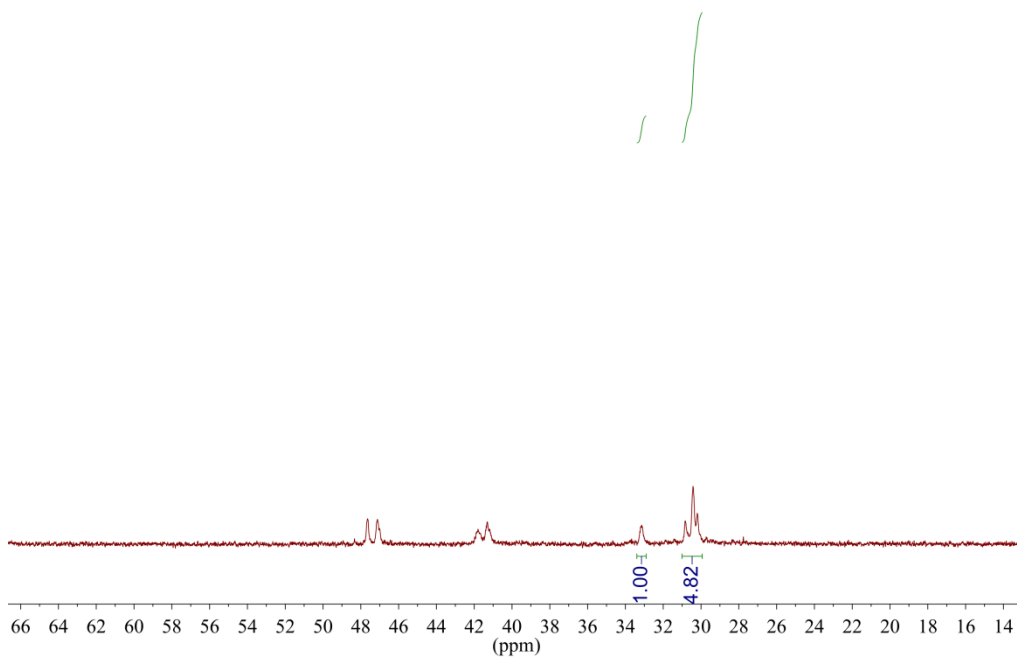


Fig. S3 ^{13}C NMR spectrum of ethylene/norbornene copolymer (Table 1, entry 3, $\text{C}_6\text{D}_4\text{Cl}_2$, 110 $^\circ\text{C}$, 400 MHz).

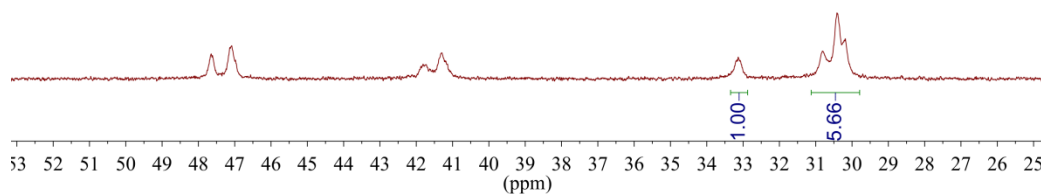


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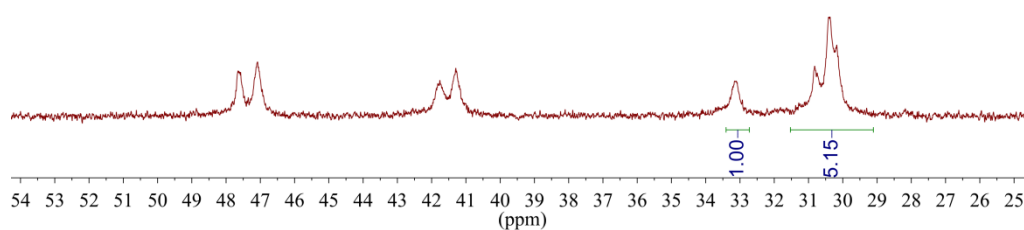


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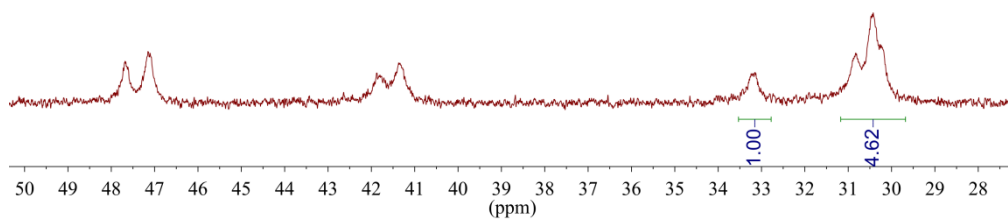


Fig. S6 ¹³C NMR spectrum of ethylene/norbornene copolymer (Table 1, entry 6, C₆D₄Cl₂, 110 °C, 400 MHz).

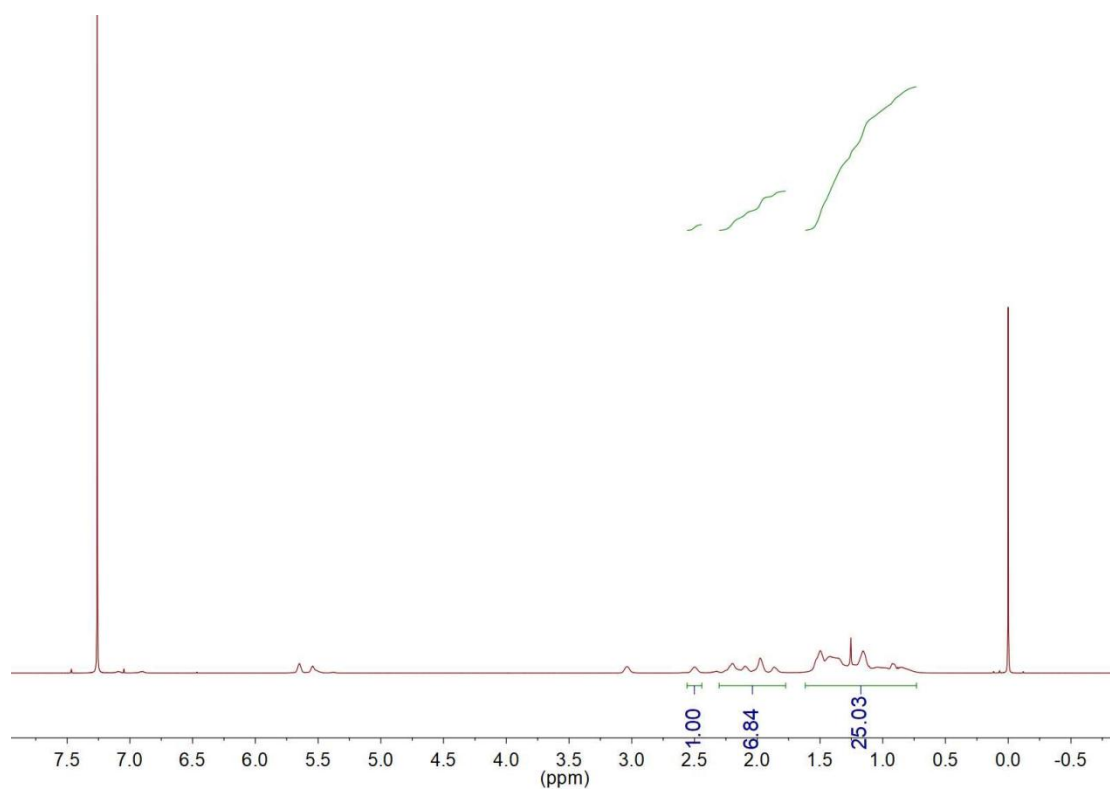


Fig. S7 ^1H NMR spectrum of ethylene/norbornene/dicyclopentadiene terpolymer (Table 1, entry 7, CDCl_3 , 25 $^\circ\text{C}$, 500 MHz).

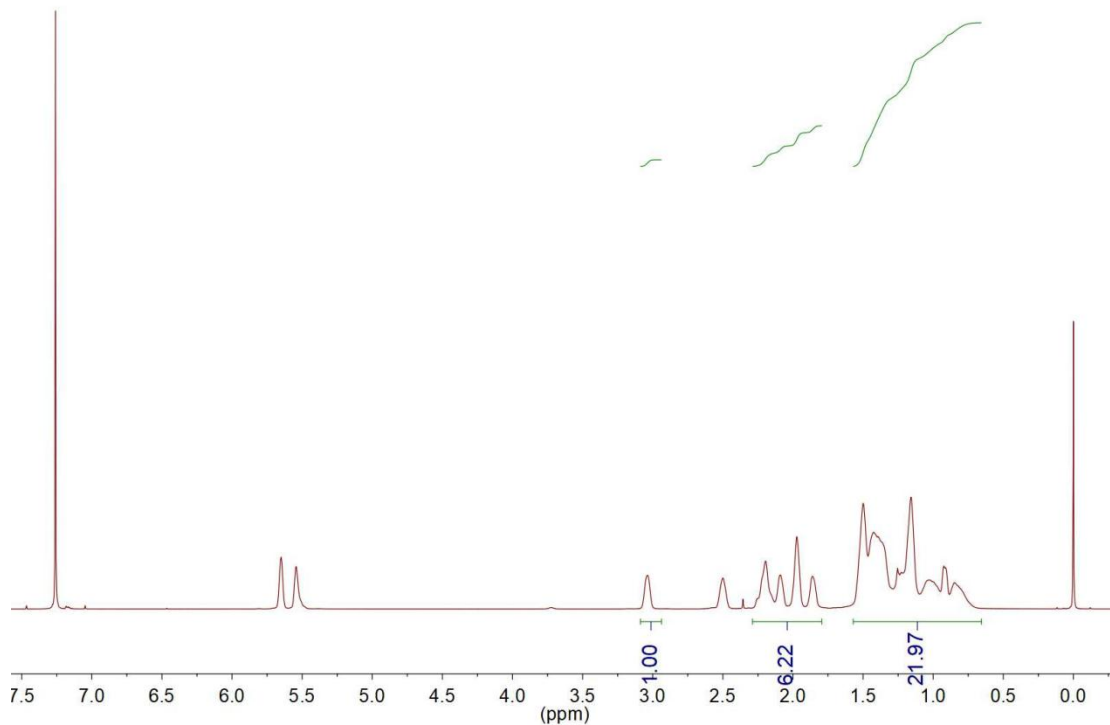


Fig. S8 ^1H NMR spectrum of ethylene/norbornene/dicyclopentadiene terpolymer (Table 1, entry 8, CDCl_3 , 25 $^\circ\text{C}$, 500 MHz).

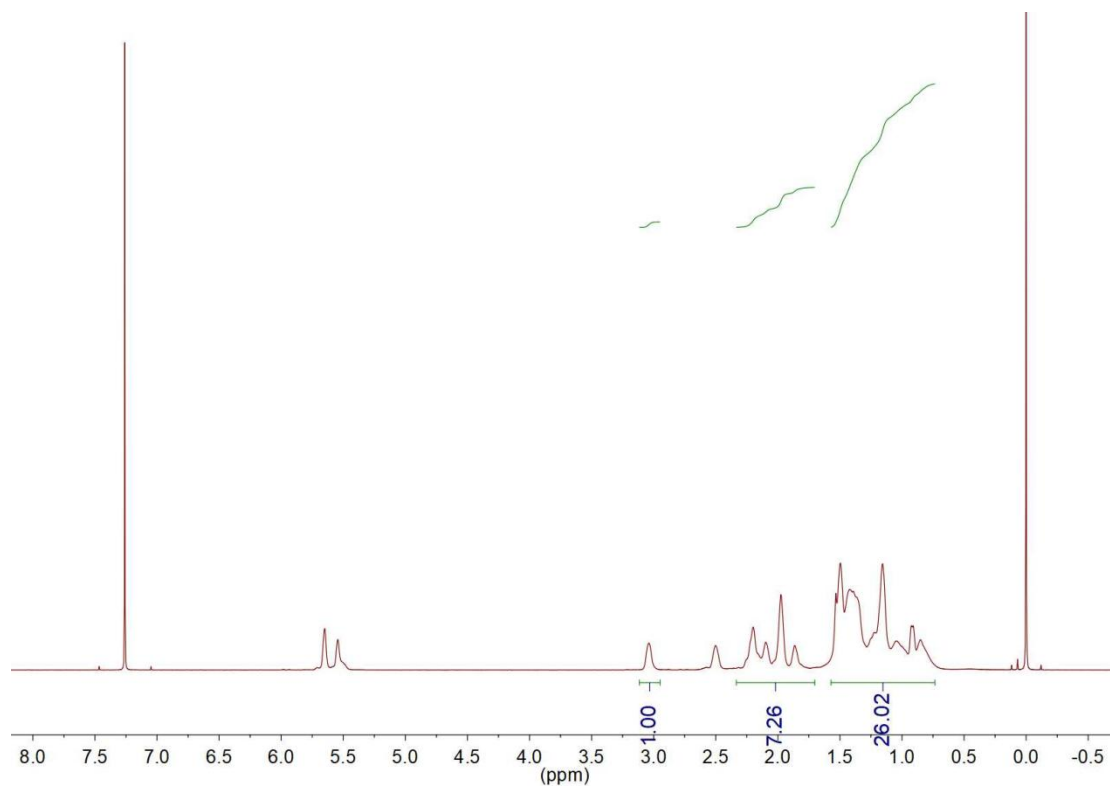


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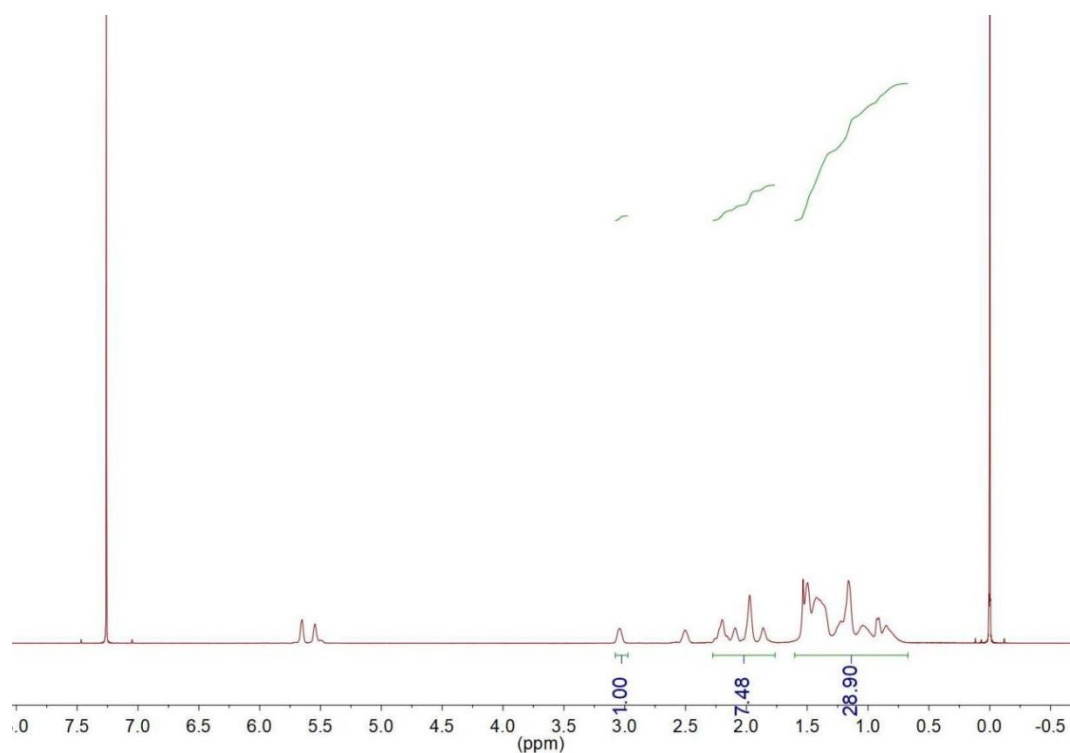


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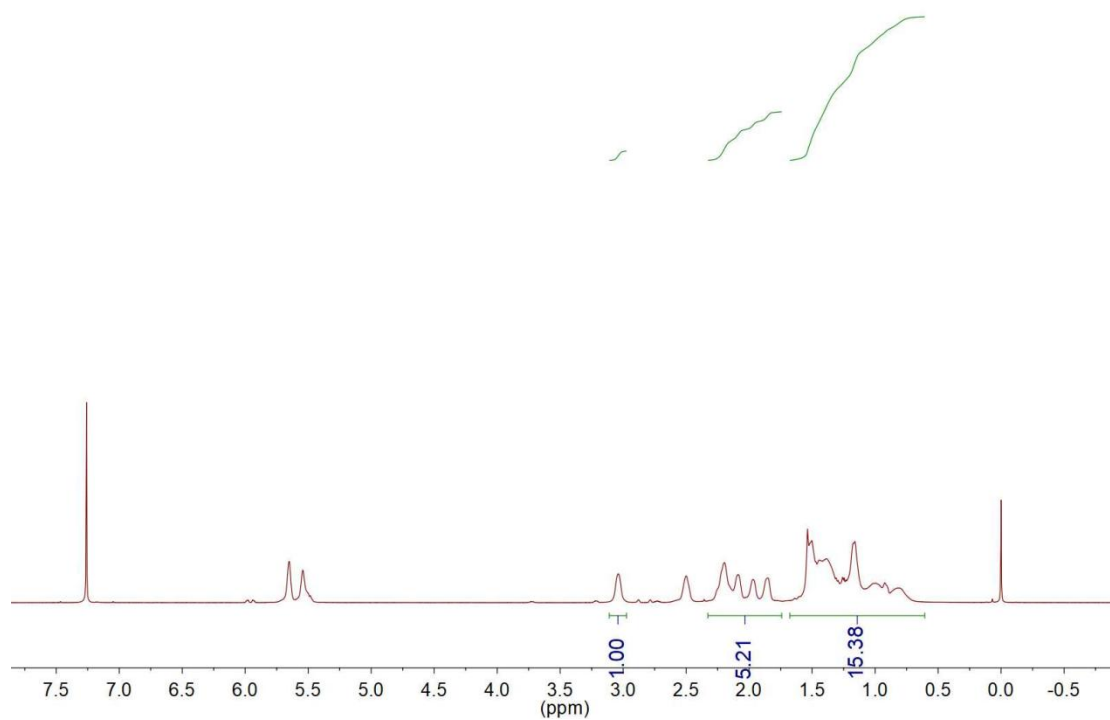


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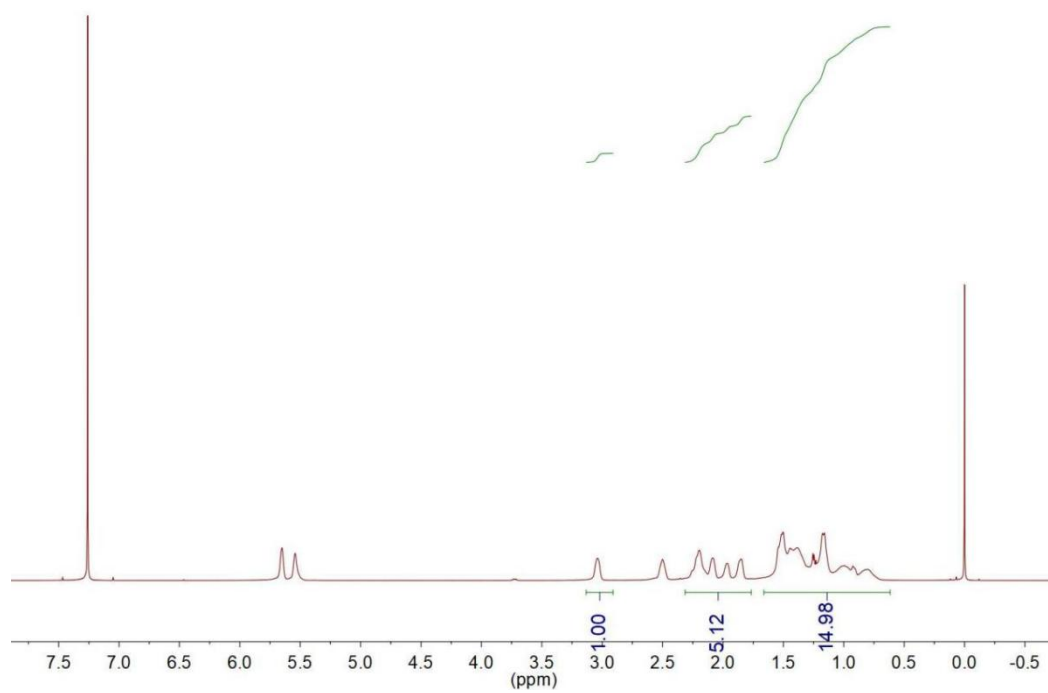


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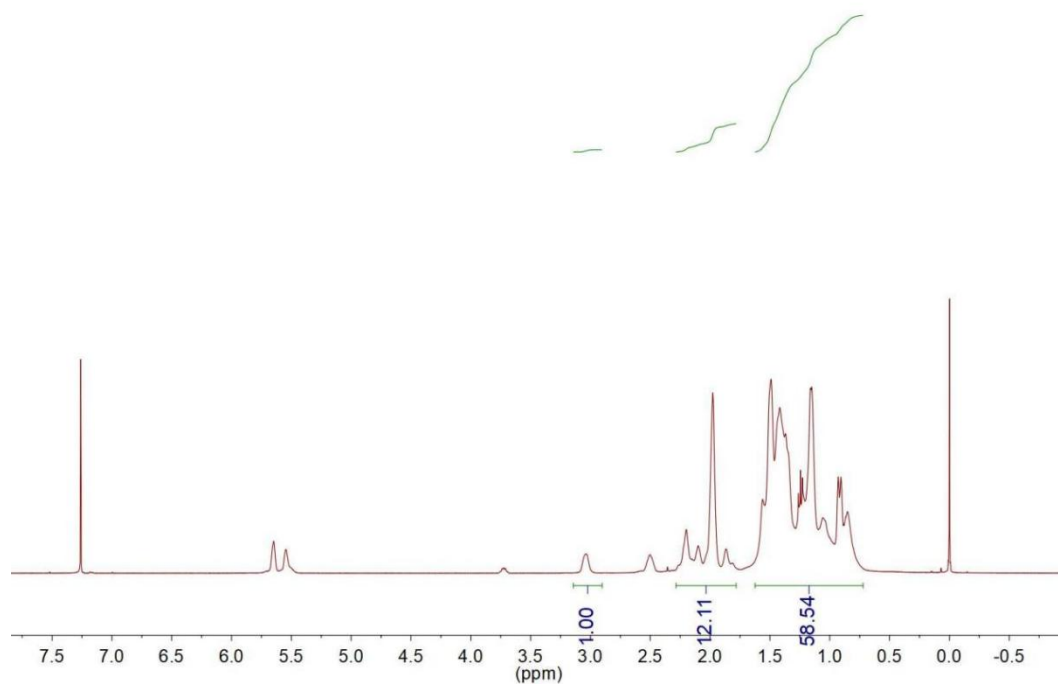


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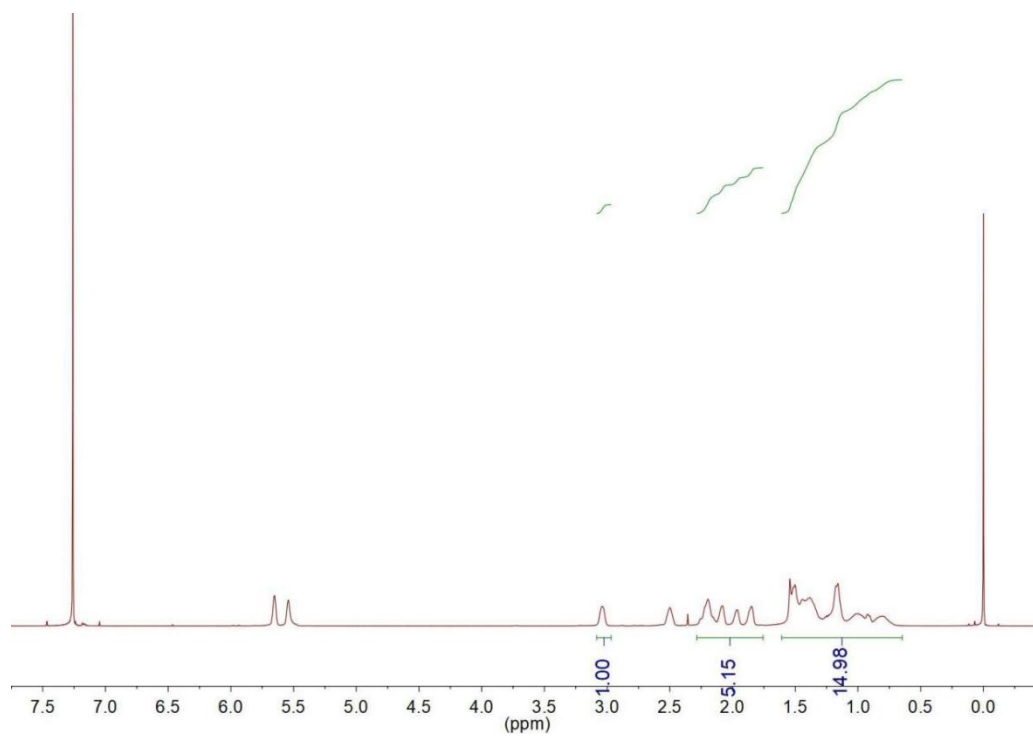


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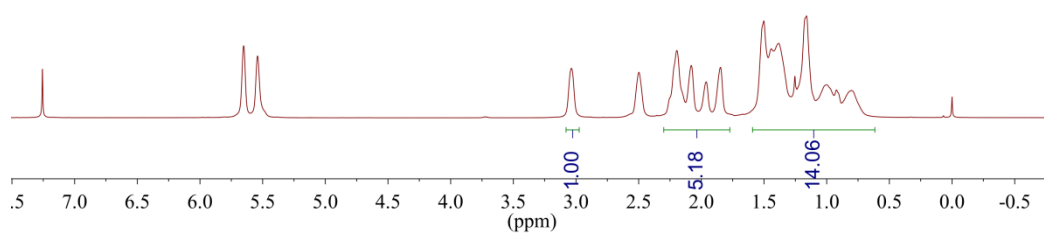


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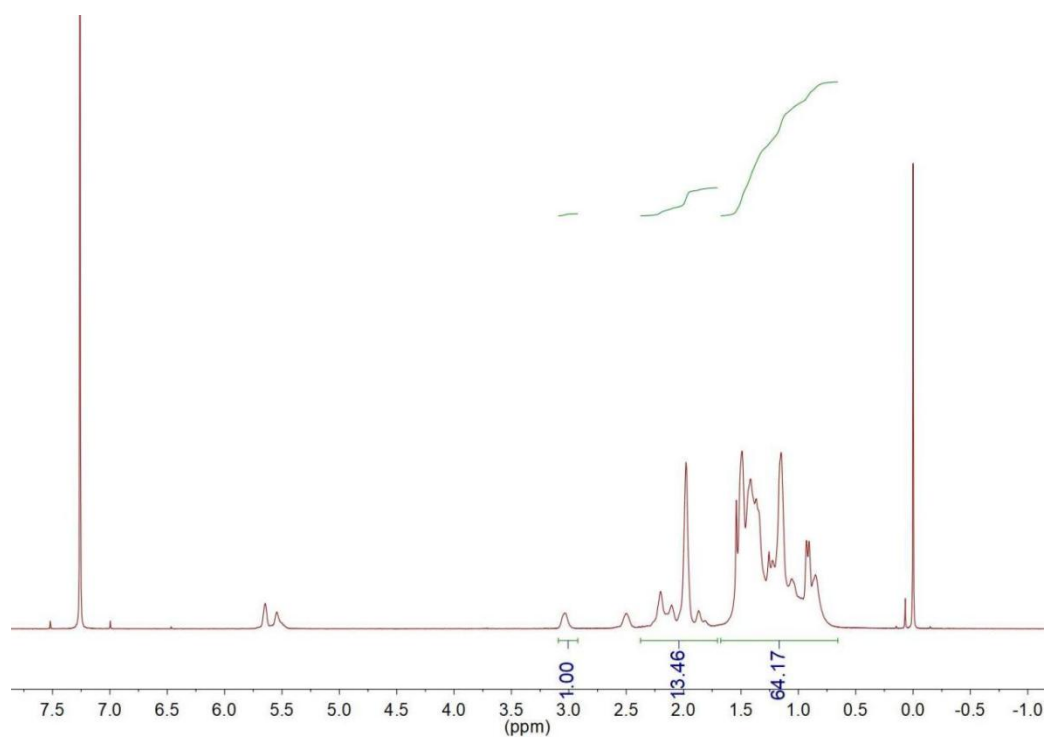


Fig. S16 ^1H NMR spectrum of ethylene/norbornene/dicyclopentadiene terpolymer (Table 1, entry 16, CDCl_3 , 25 $^\circ\text{C}$, 500 MHz).

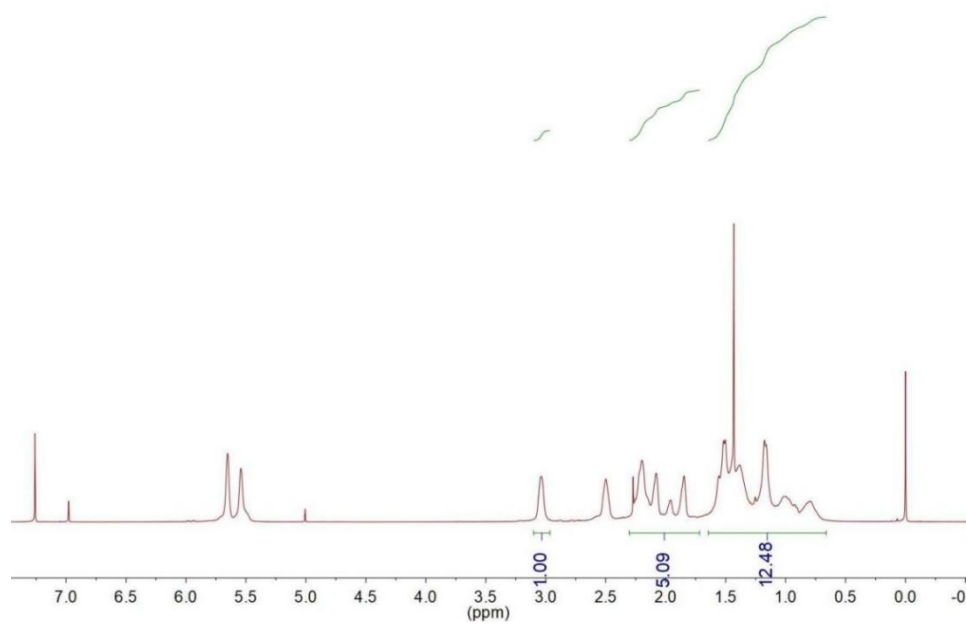


Fig. S17 ^1H NMR spectrum of ethylene/norbornene/dicyclopentadiene terpolymer (Table 1, entry 17, CDCl_3 , 25 $^\circ\text{C}$, 500 MHz).

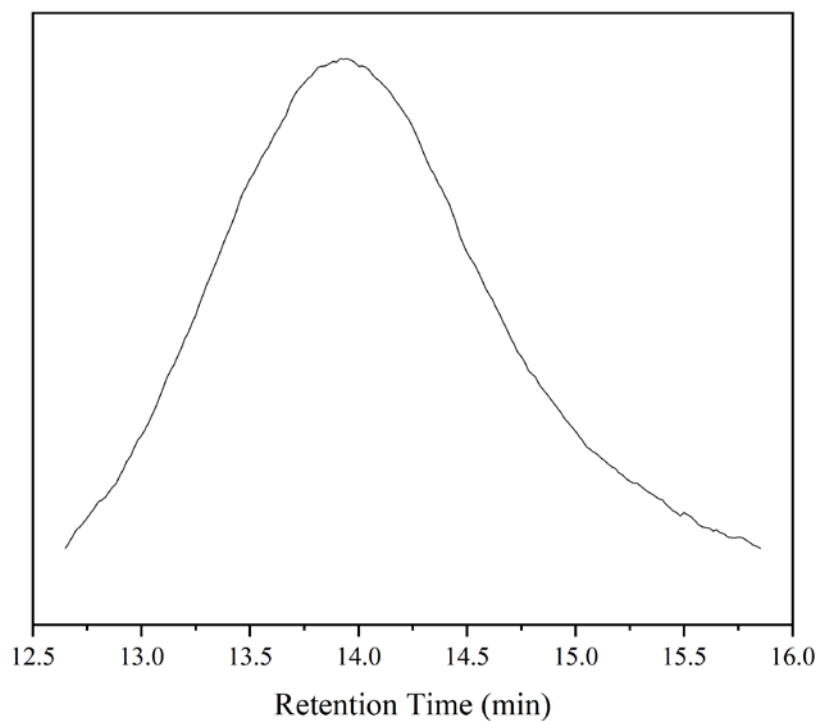


Fig. S18 GPC curve of ethylene/norbornene copolymer (Table 1, entry 1).

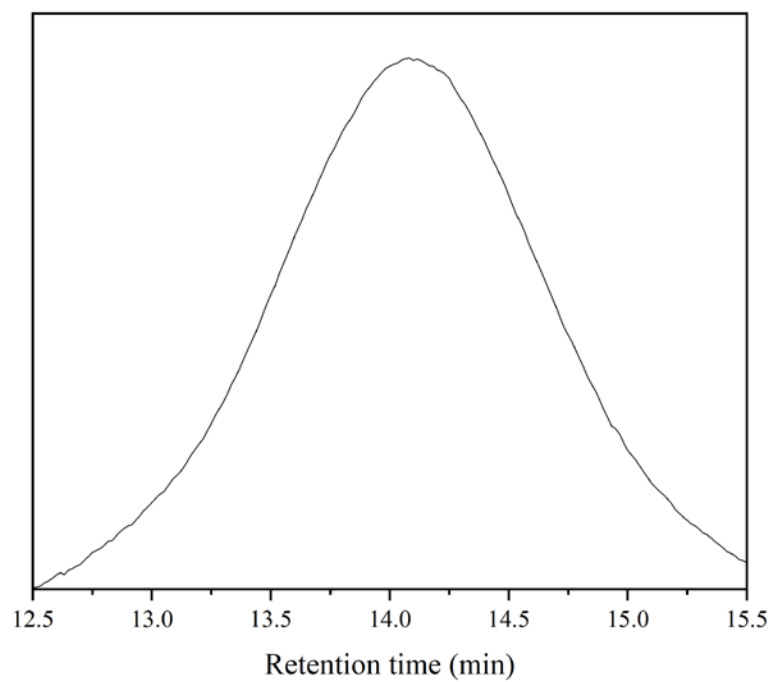


Fig. S19 GPC curve of ethylene/norbornene copolymer (Table 1, entry 2).

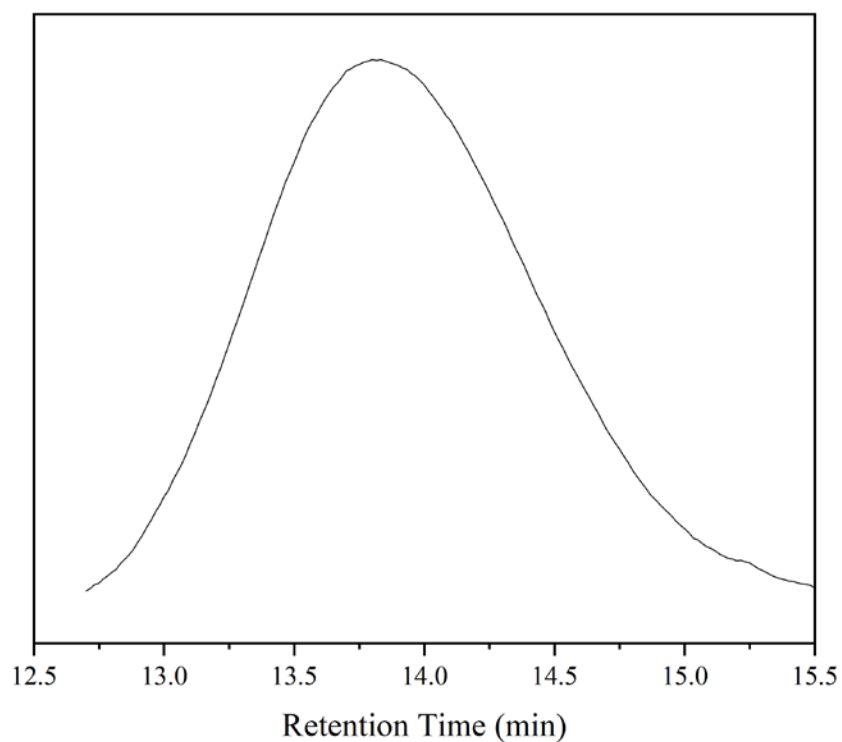


Fig. S20 GPC curve of ethylene/norbornene copolymer (Table 1, entry 3).

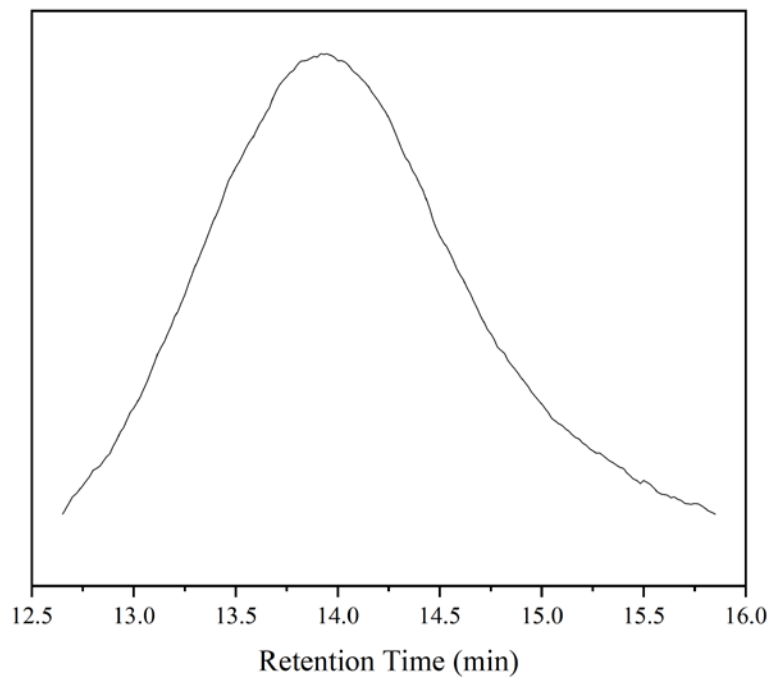


Fig. S21 GPC curve of ethylene/norbornene copolymer (Table 1, entry 4).

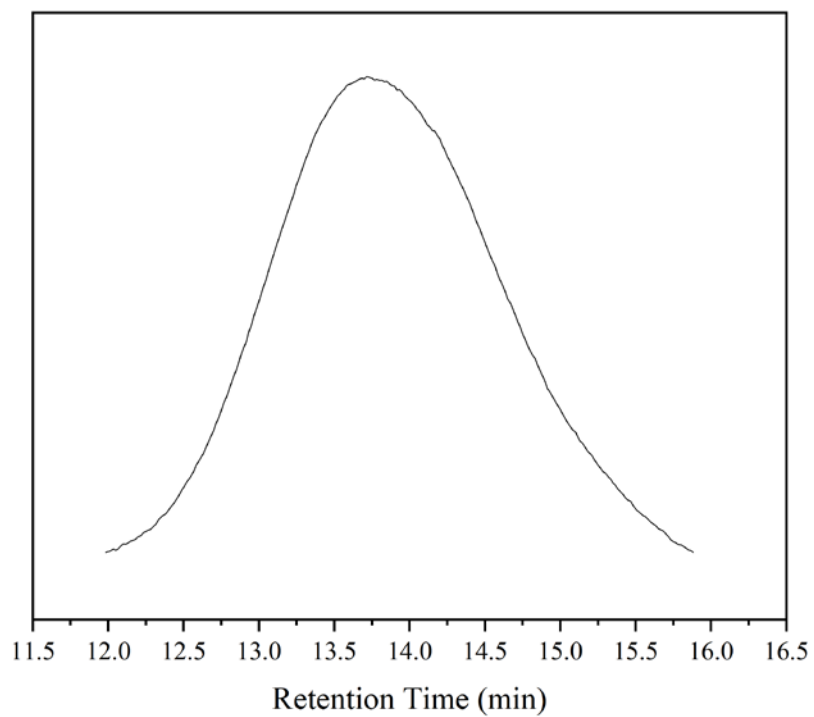


Fig. S22 GPC curve of ethylene/norbornene copolymer (Table 1, entry 5).

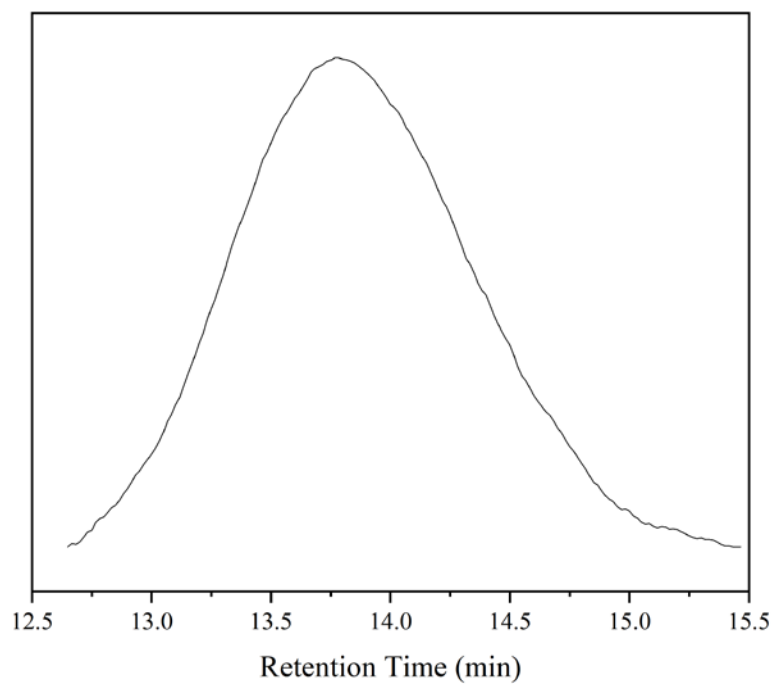


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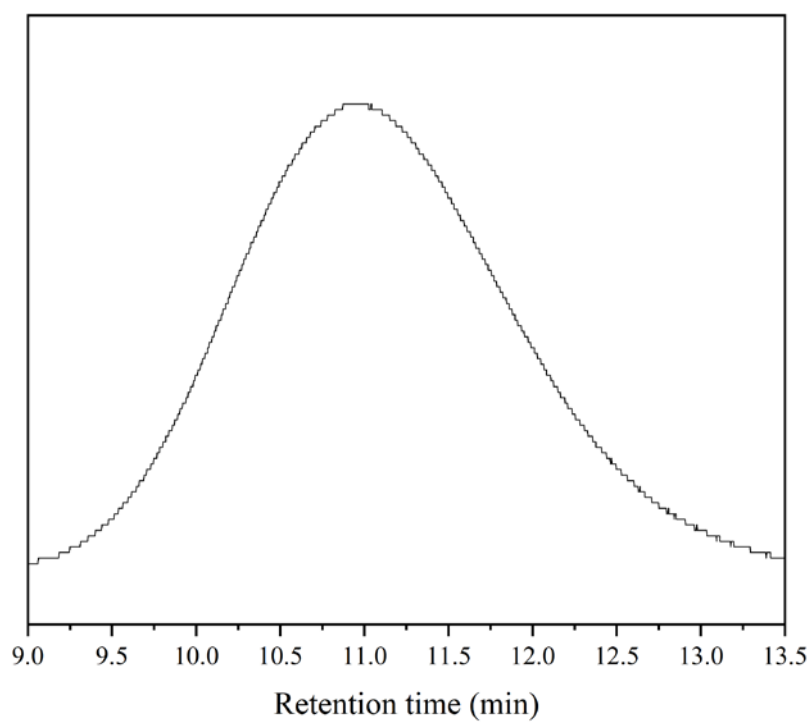


Fig. S24 GPC curve of ethylene/norbornene/dicyclopentadiene terpolymer (Table 1, entry 7).

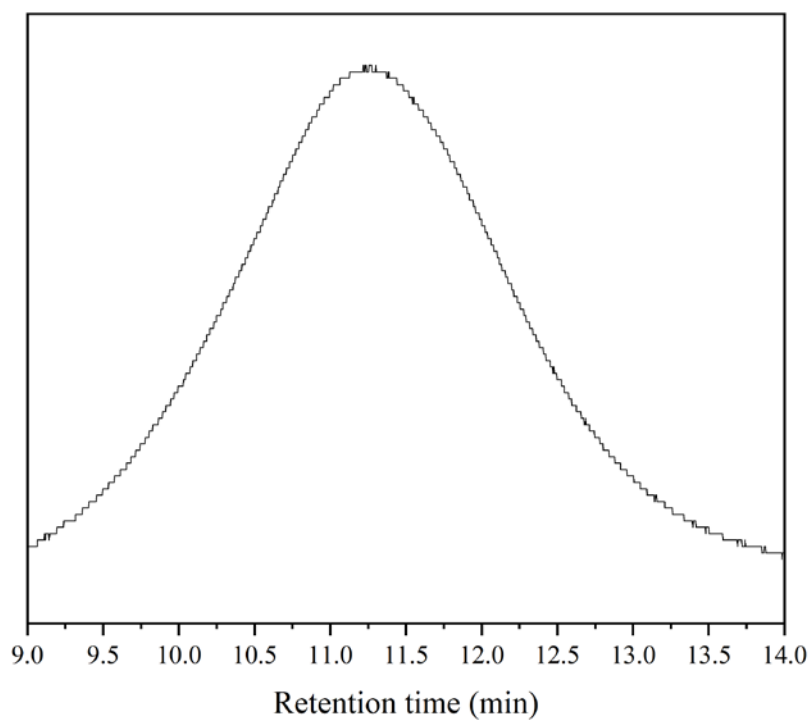


Fig. S25 GPC curve of ethylene/norbornene/dicyclopentadiene terpolymer (Table 1, entry 8).

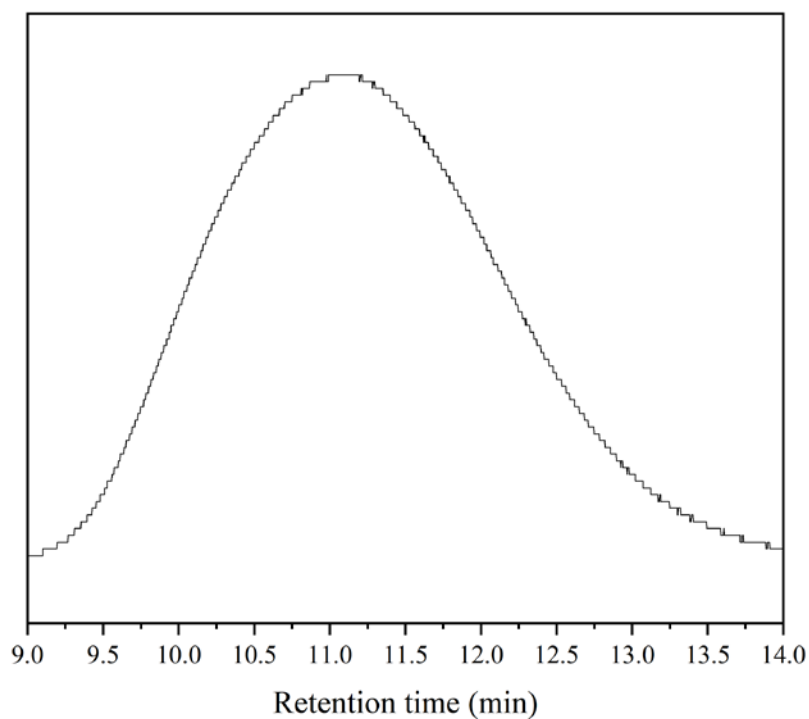


Fig. S26 GPC curve of ethylene/norbornene/dicyclopentadiene terpolymer (Table 1, entry 9).

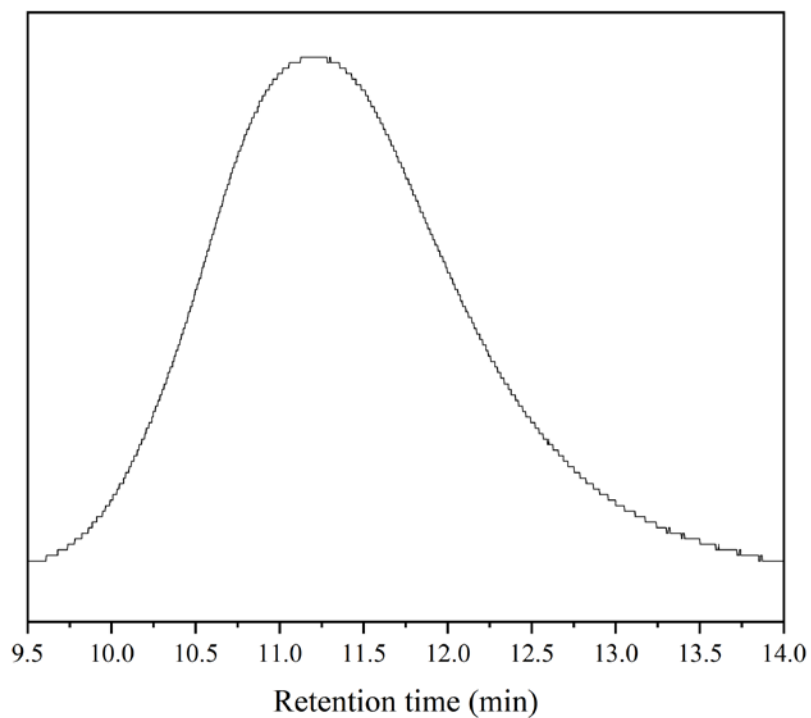


Fig. S27 GPC curve of ethylene/norbornene/dicyclopentadiene terpolymer (Table 1, entry 10).

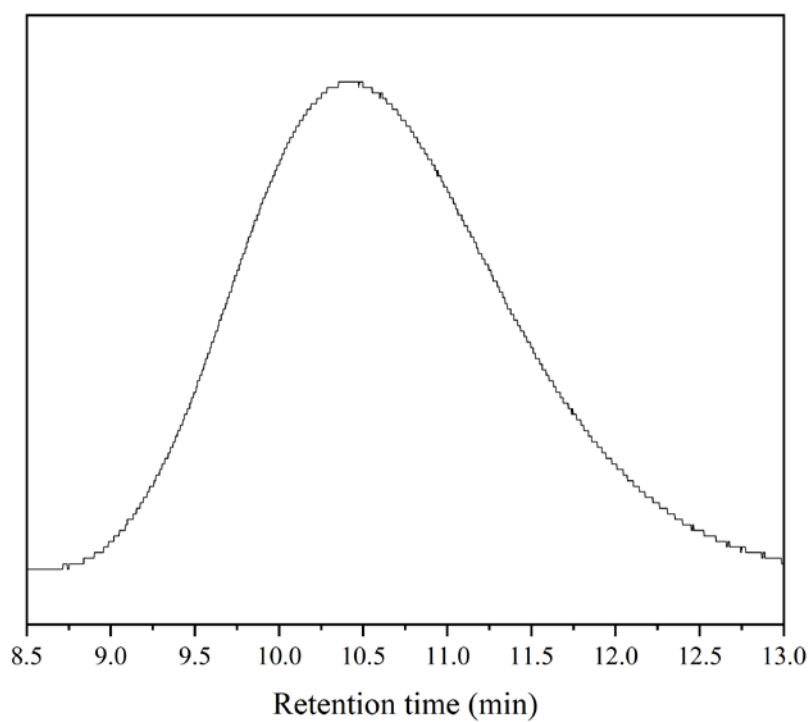


Fig. S28 GPC curve of ethylene/norbornene/dicyclopentadiene terpolymer (Table 1, entry 11).

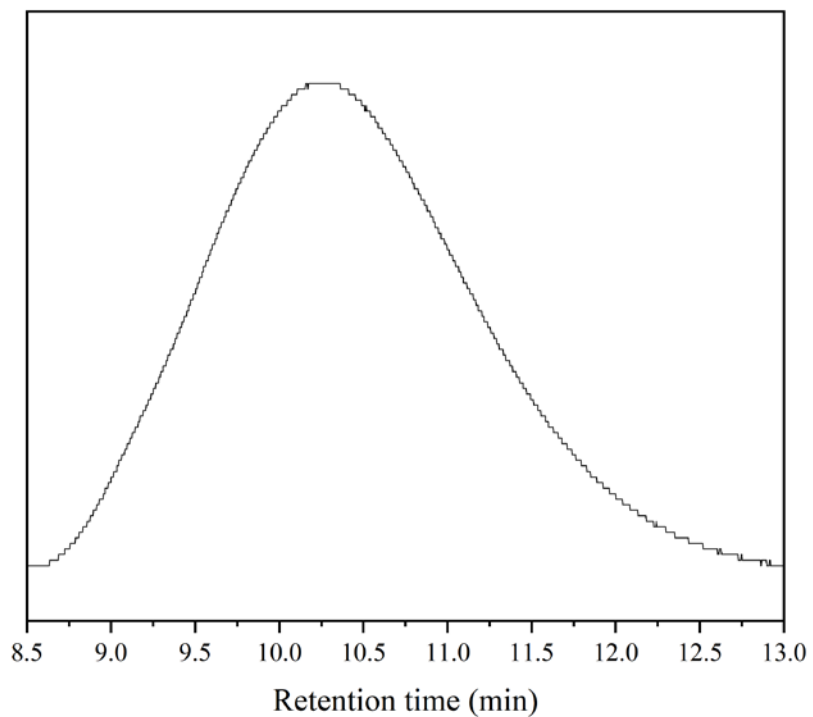


Fig. S29 GPC curve of ethylene/norbornene/dicyclopentadiene terpolymer (Table 1, entry 12).

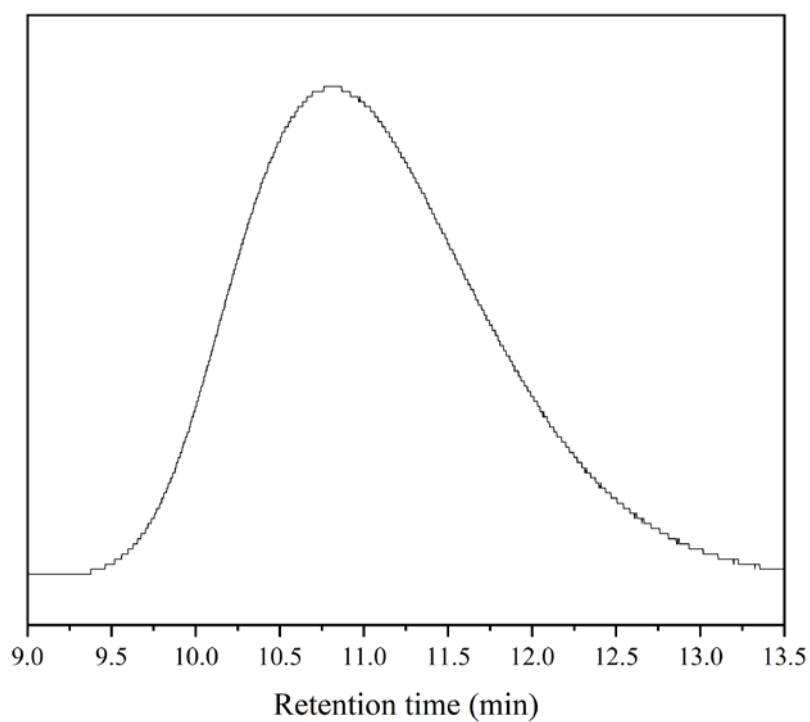


Fig. S30 GPC curve of ethylene/norbornene/dicyclopentadiene terpolymer (Table 1, entry 13).

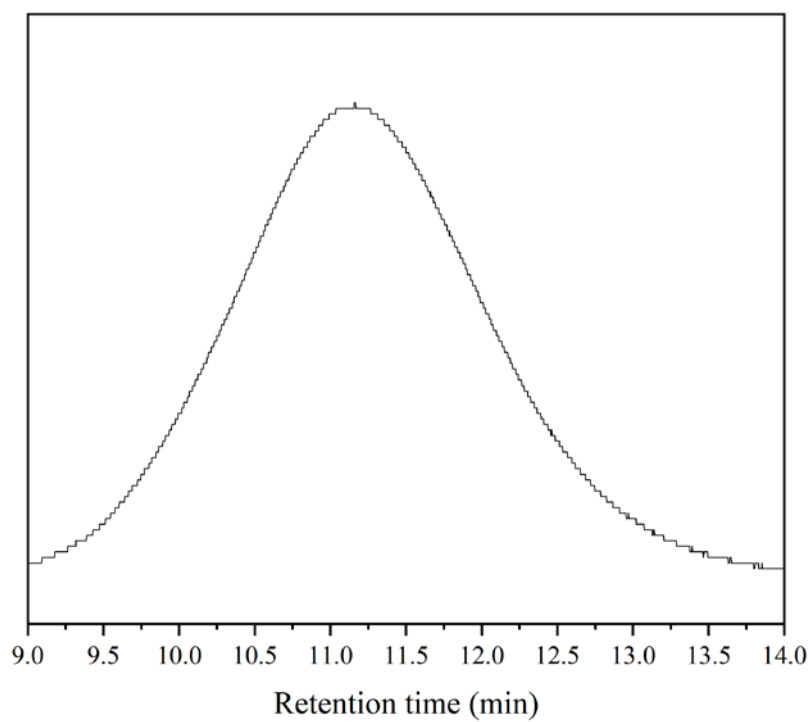


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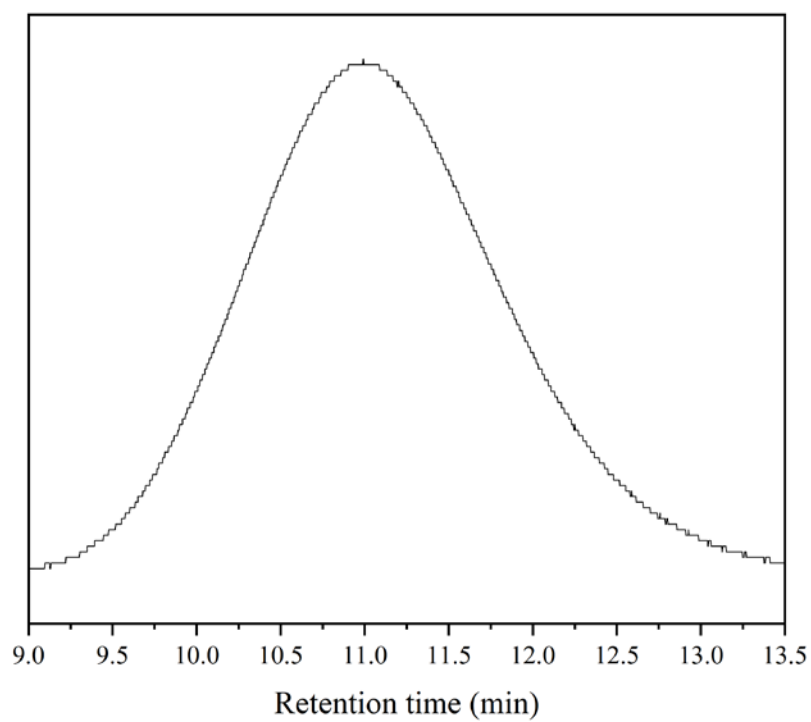


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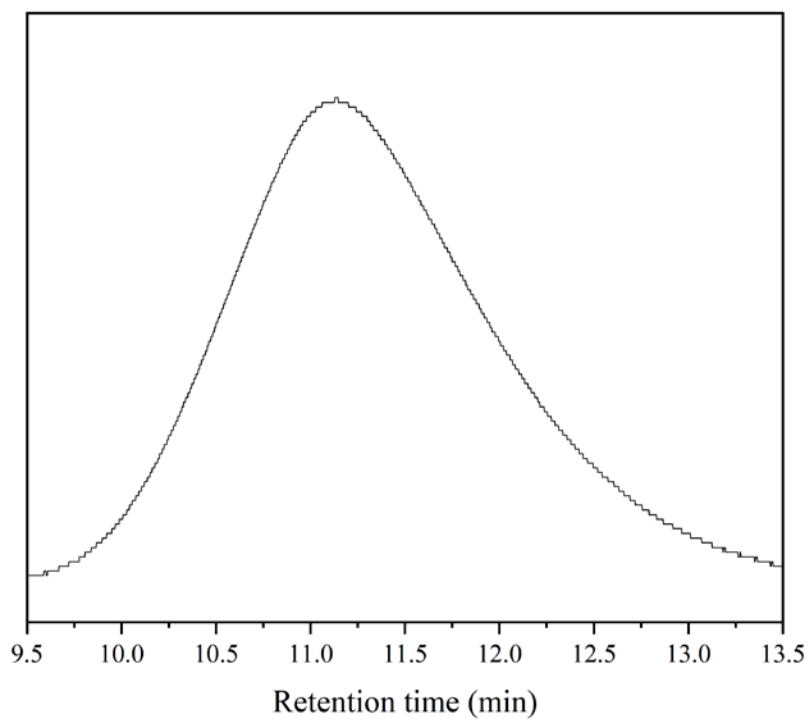


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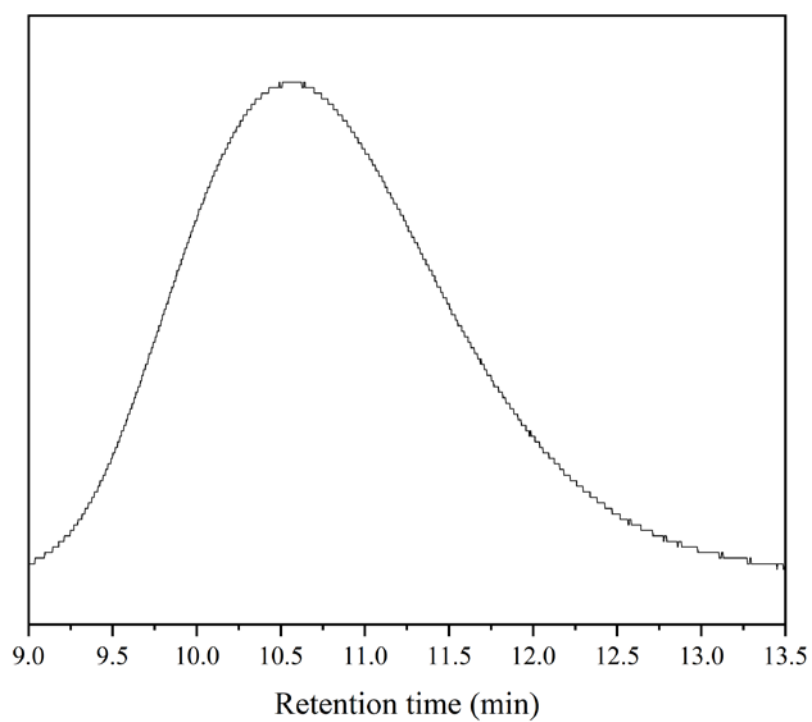


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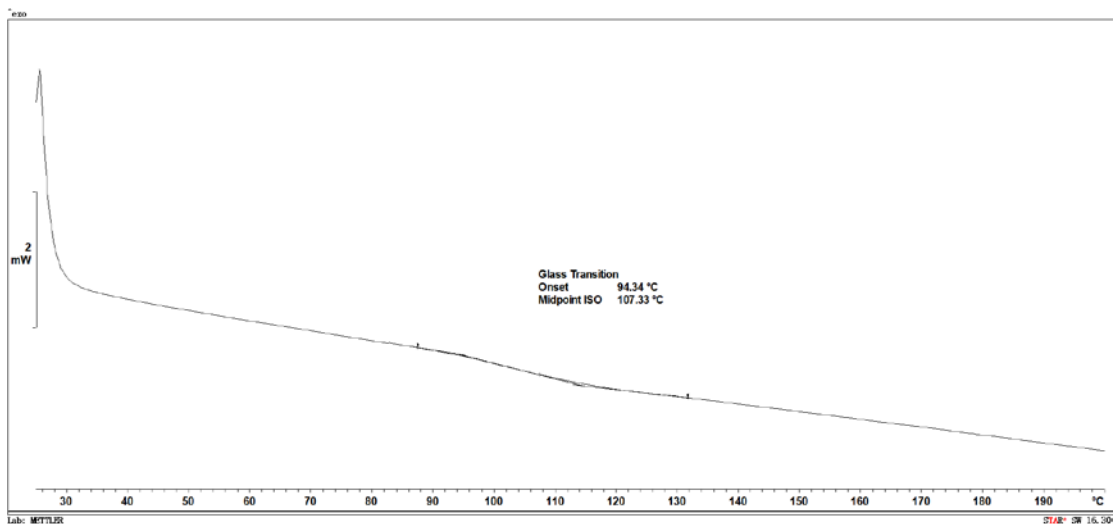


Fig. S35 DSC curve of the ethylene/norbornene copolymer (Table 1, entry 1).

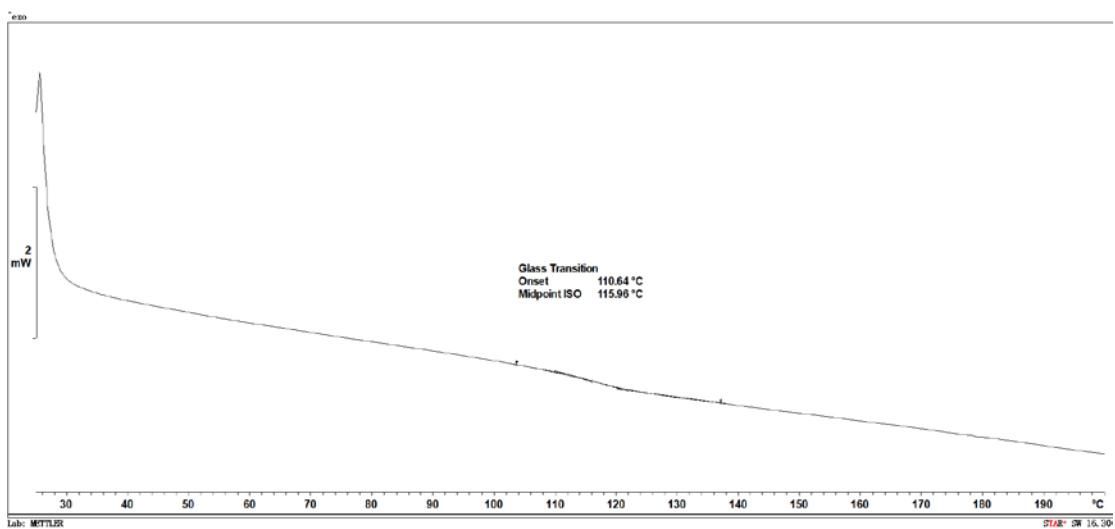


Fig. S36 DSC curve of the ethylene/norbornene copolymer (Table 1, entry 2).

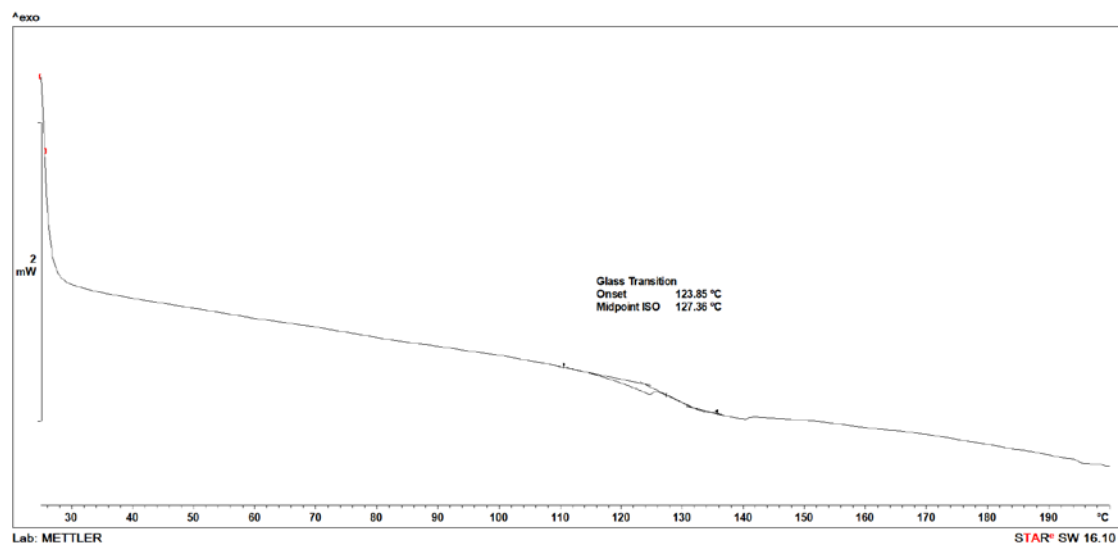


Fig. S37 DSC curve of the ethylene/norbornene copolymer (Table 1, entry 3).

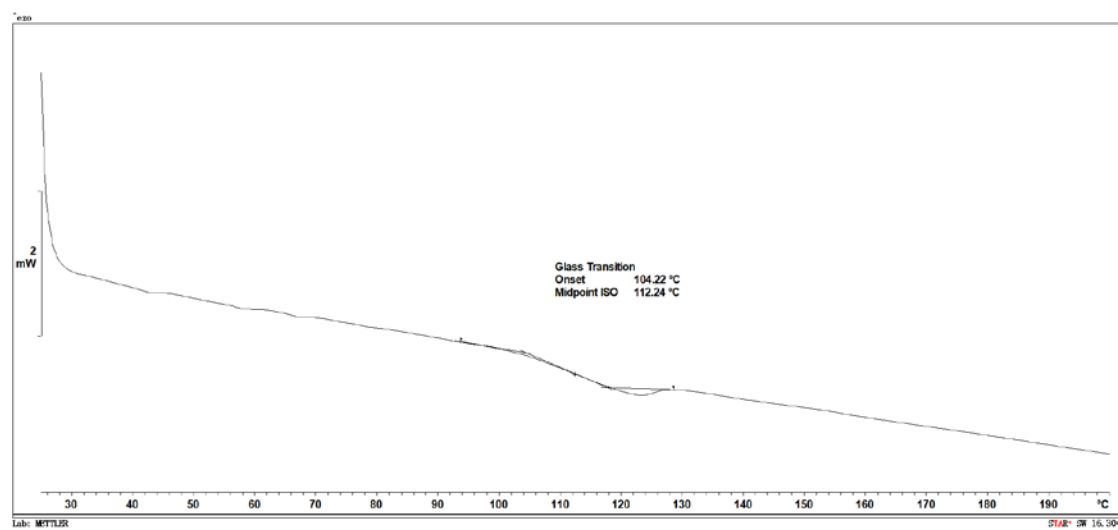


Fig. S38 DSC curve of the ethylene/norbornene copolymer (Table 1, entry 4).

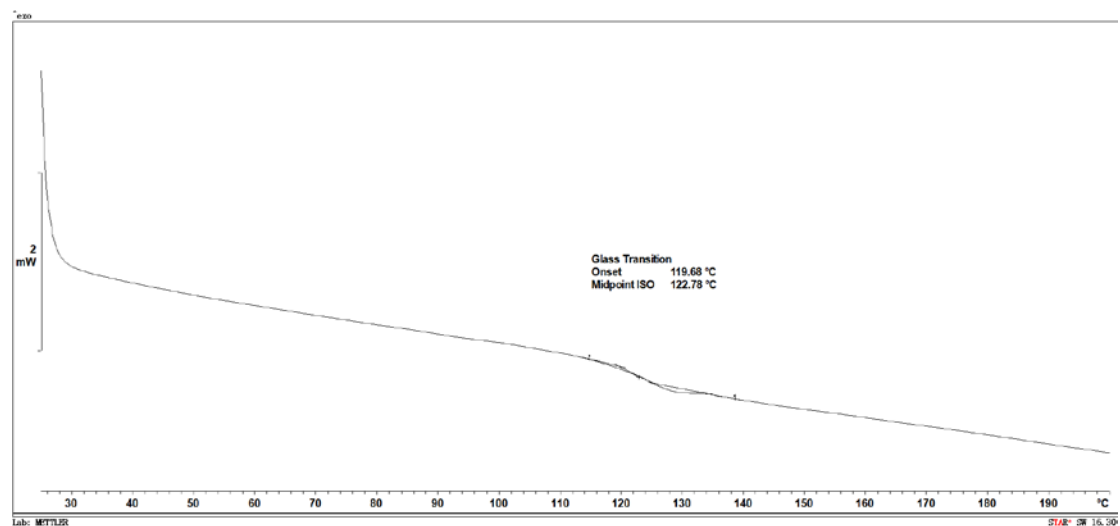


Fig. S39 DSC curve of the ethylene/norbornene copolymer (Table 1, entry 5).

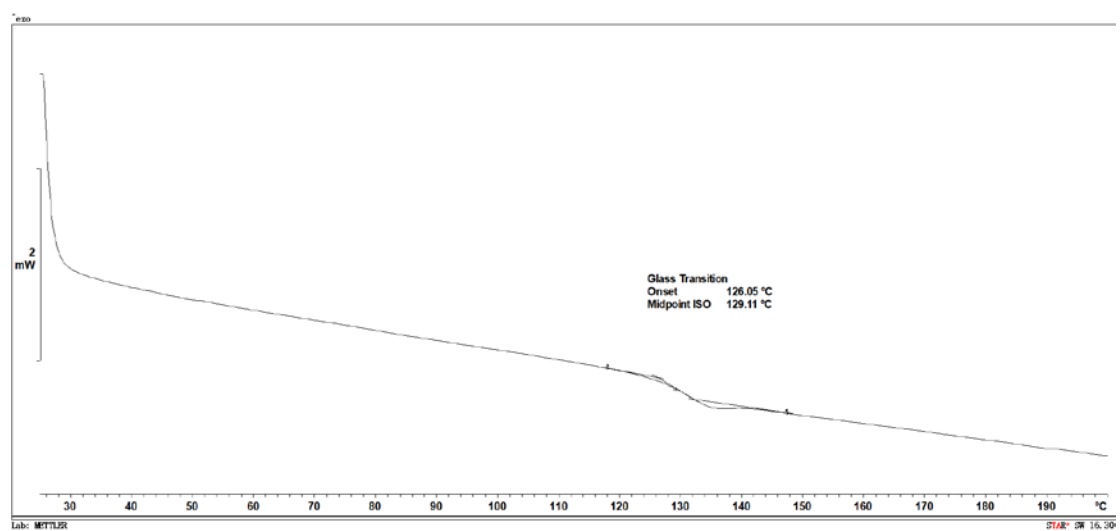


Fig. S40 DSC curve of the ethylene/norbornene copolymer (Table 1, entry 6).

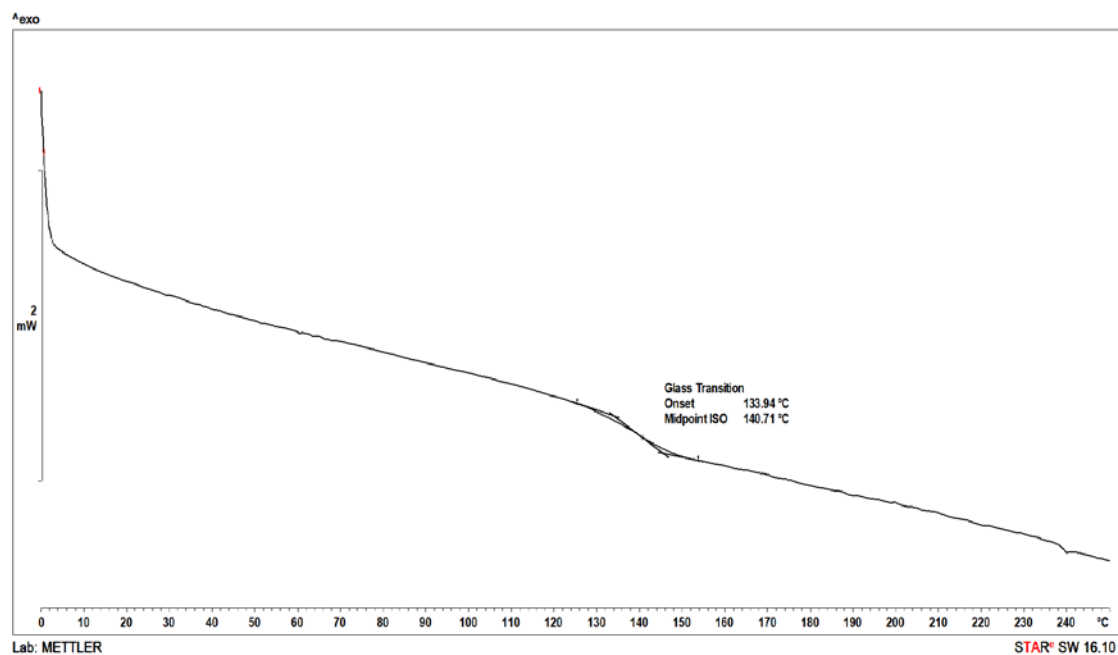


Fig. S41 DSC curve of the ethylene/norbornene/dicyclopentadiene terpolymer (Table 1, entry 7).

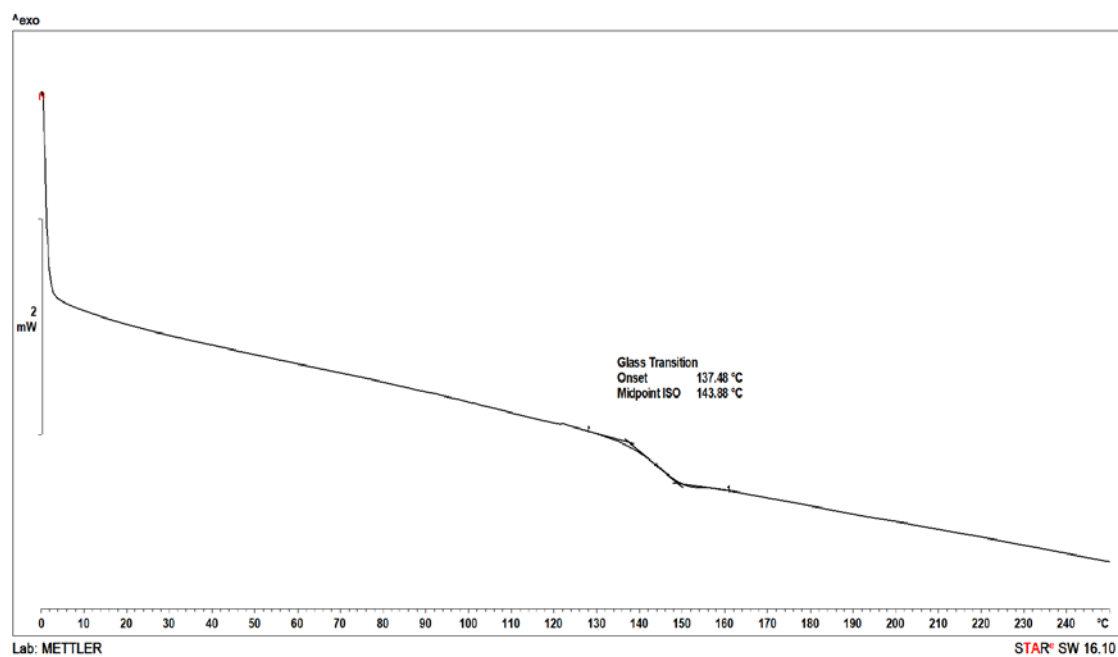


Fig. S42 DSC curve of the ethylene/norbornene/dicyclopentadiene terpolymer (Table 1, entry 8).

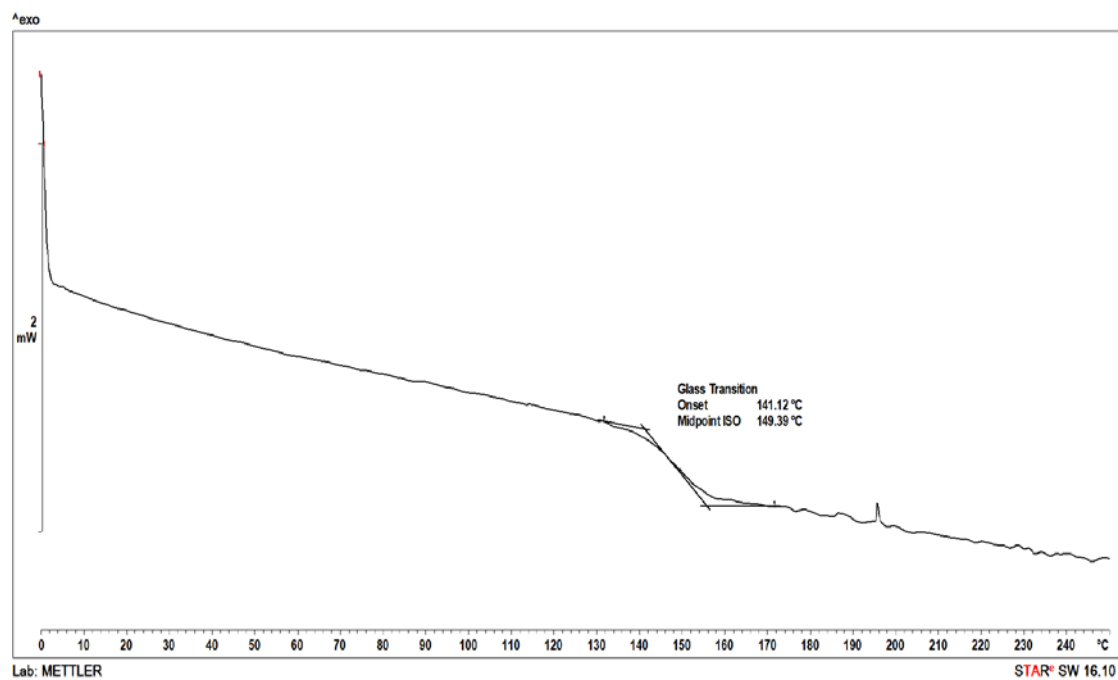


Fig. S43 DSC curve of the ethylene/norbornene/dicyclopentadiene terpolymer (Table 1, entry 9).

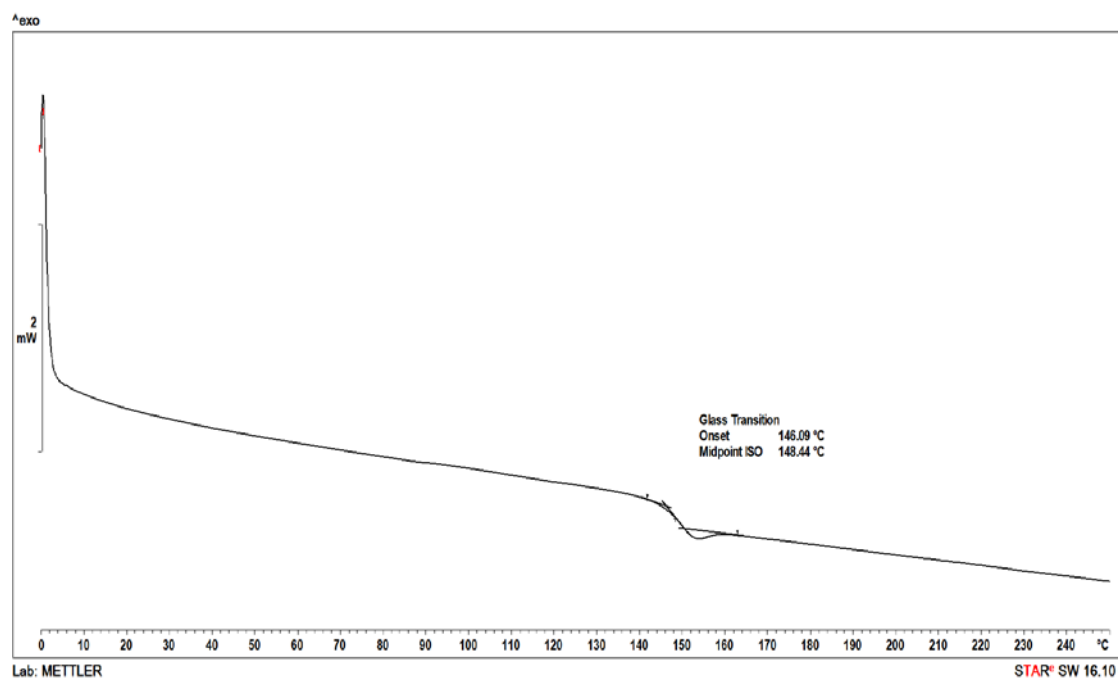


Fig. S44 DSC curve of the ethylene/norbornene/dicyclopentadiene terpolymer (Table 1, entry 10).

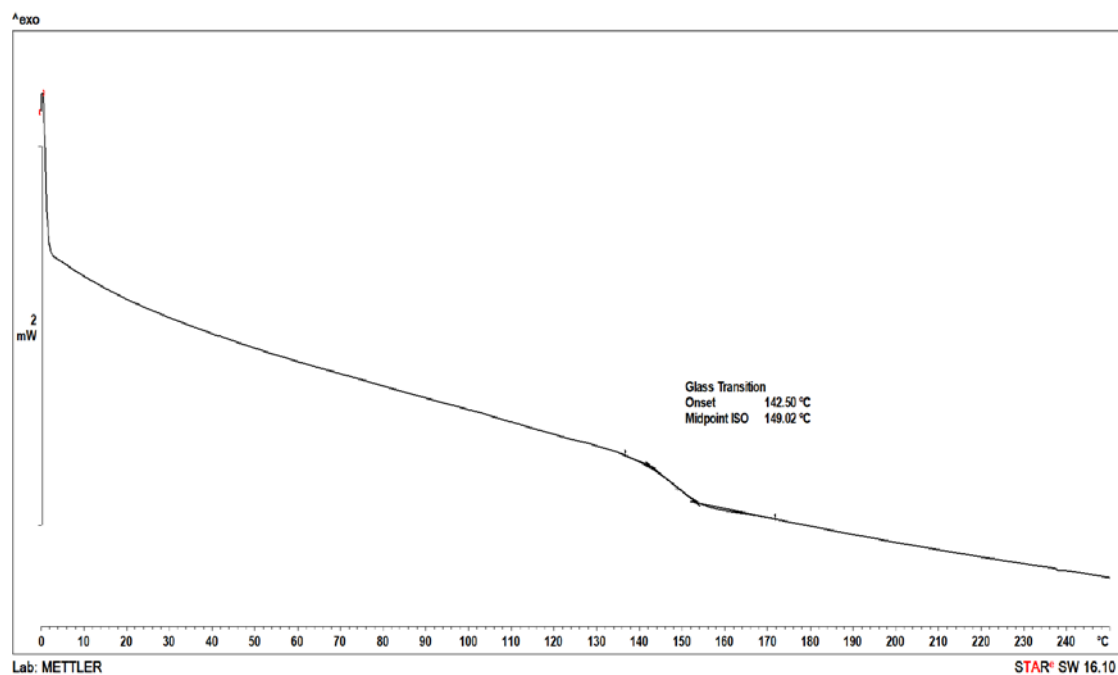


Fig. S45 DSC curve of the ethylene/norbornene/dicyclopentadiene terpolymer (Table 1, entry 11).

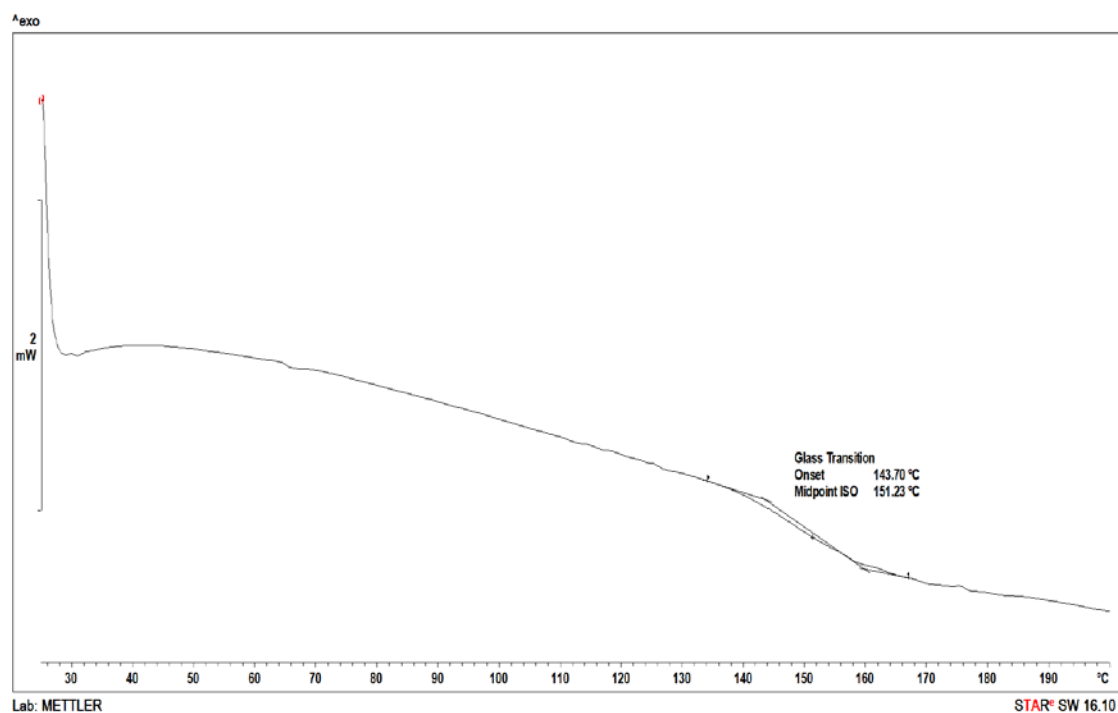


Fig. S46 DSC curve of the ethylene/norbornene/dicyclopentadiene terpolymer (Table 1, entry 12).

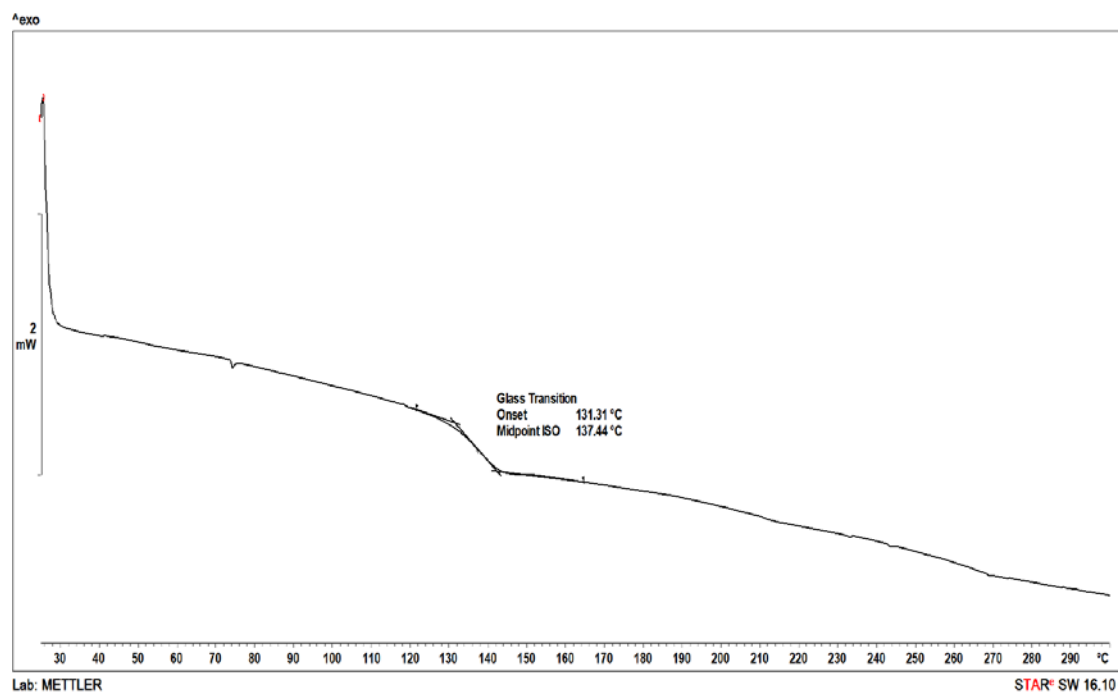


Fig. S47 DSC curve of the ethylene/norbornene/dicyclopentadiene terpolymer (Table 1, entry 13).

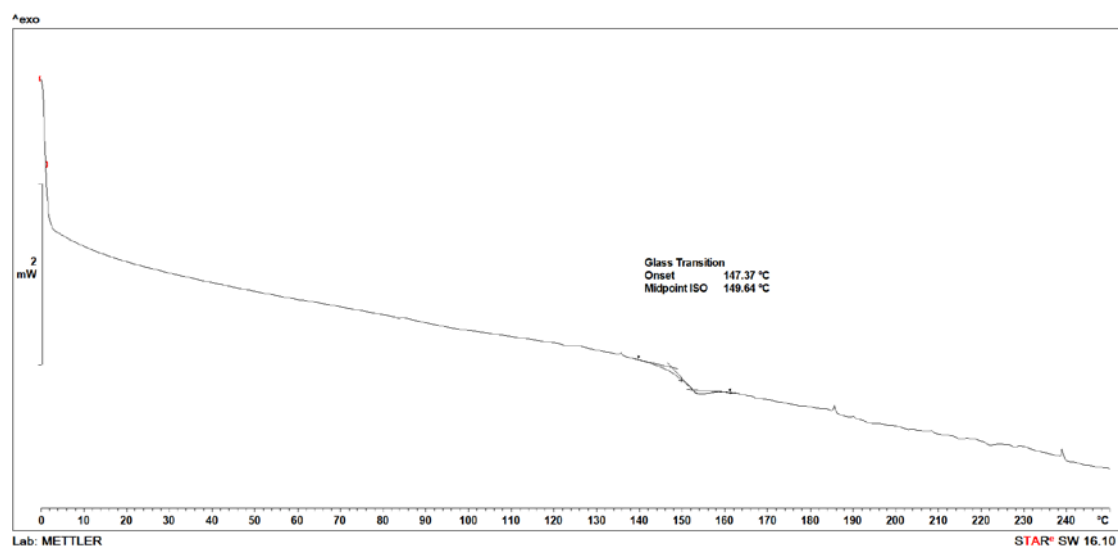


Fig. S48 DSC curve of the ethylene/norbornene/dicyclopentadiene terpolymer (Table 1, entry 14).

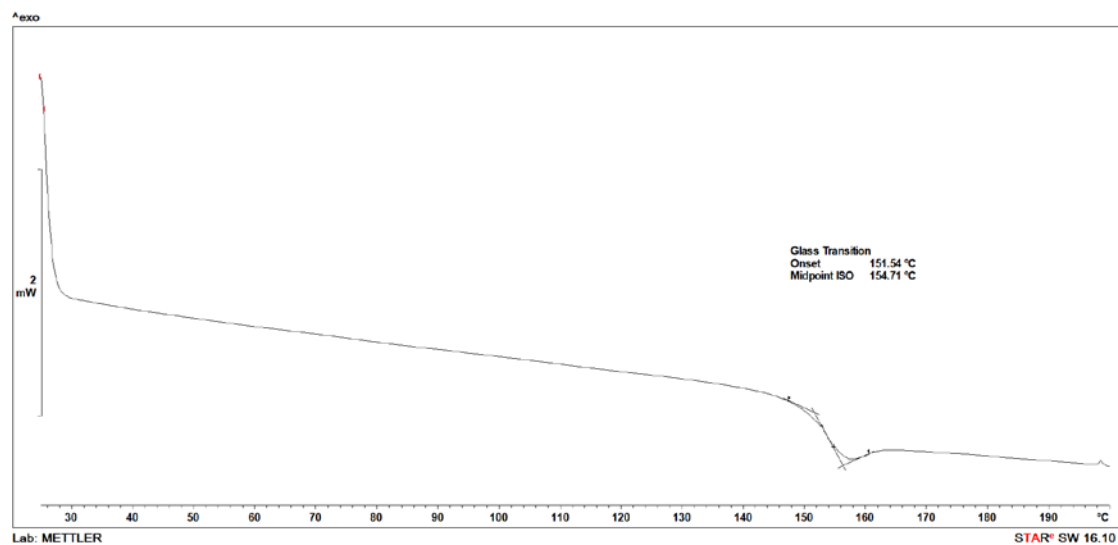


Fig. S49 DSC curve of the ethylene/norbornene/dicyclopentadiene terpolymer (Table 1, entry 15).

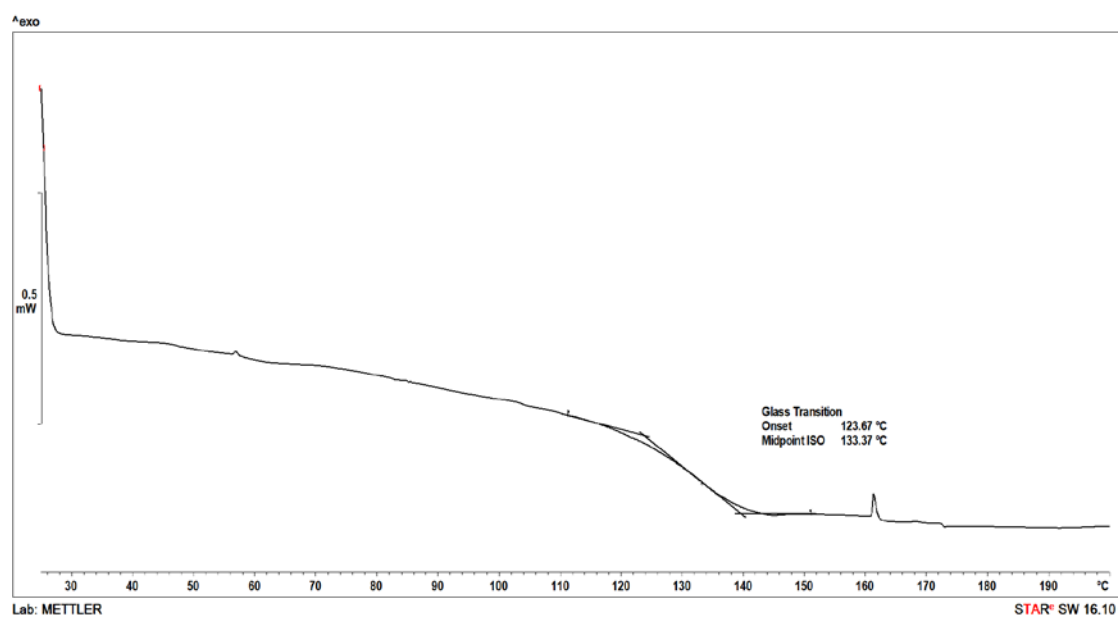


Fig. S50 DSC curve of the ethylene/norbornene/dicyclopentadiene terpolymer (Table 1, entry 16).

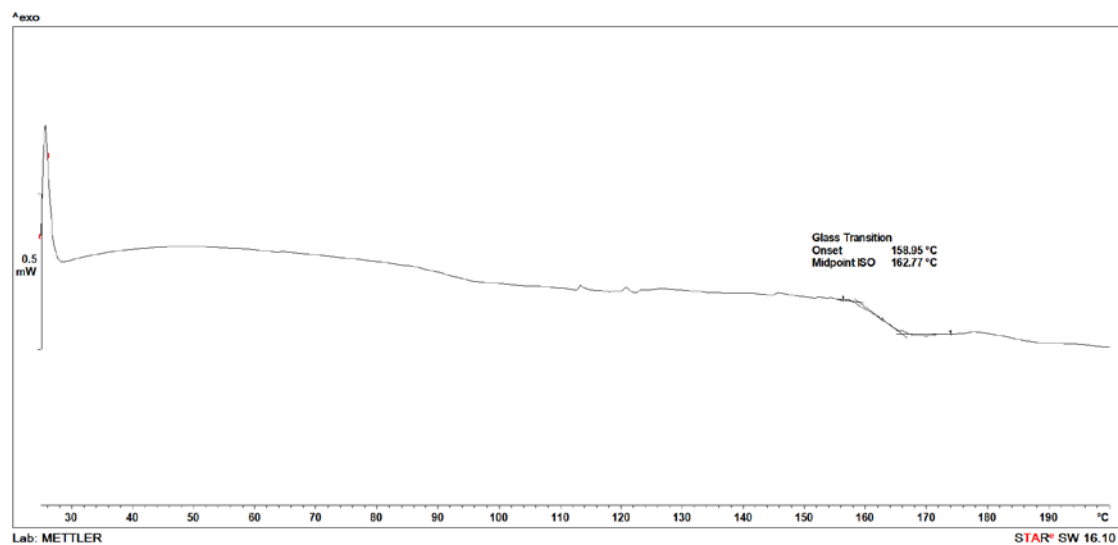


Fig. S51 DSC curve of the ethylene/norbornene/dicyclopentadiene terpolymer (Table 1, entry 17).

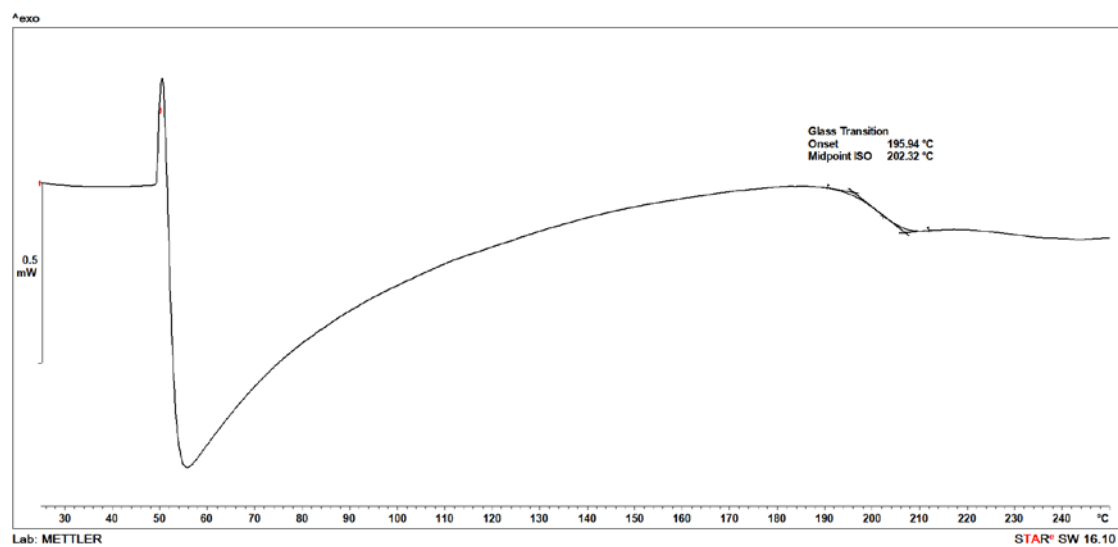


Fig. S52 DSC curve of ethylene/norbornene/dicyclopentadiene hydroxylated terpolymer (Table 1, entry 17).

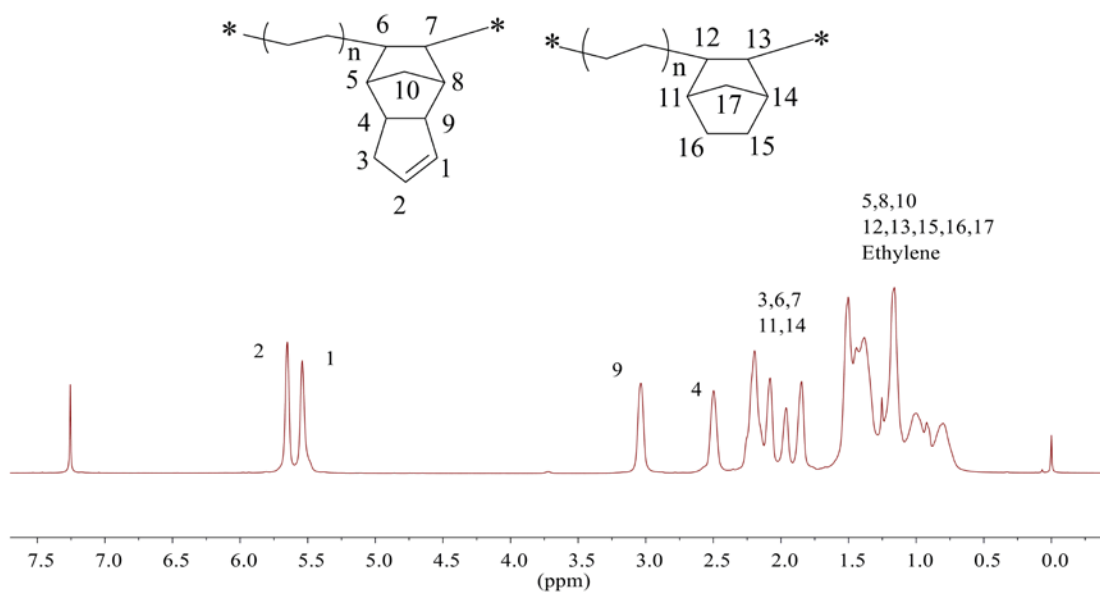


Fig. S53 ^1H NMR spectrum of ethylene/norbornene/dicyclopentadiene terpolymer (Table 1, entry 15, CDCl_3 , 25 $^\circ\text{C}$, 500 MHz).

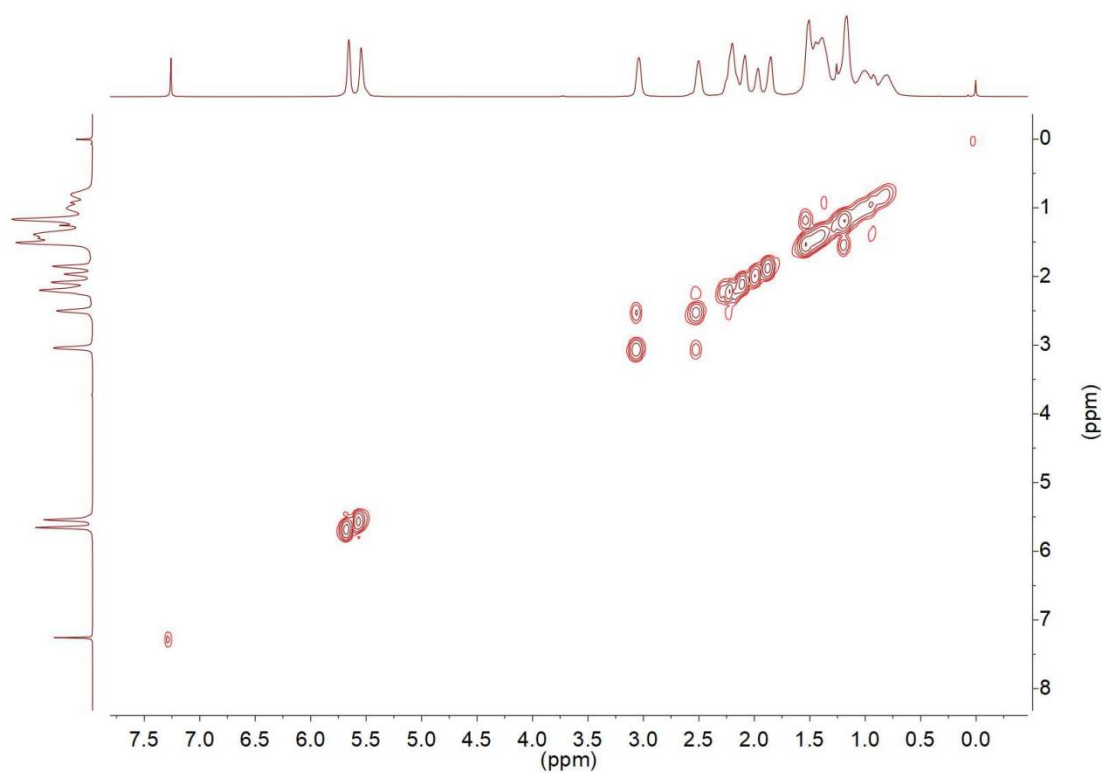


Fig. S54 ^1H - ^1H COSY spectrum of ethylene/norbornene/dicyclopentadiene terpolymer (Table 1, entry 15, CDCl_3 , 25 $^\circ\text{C}$, 500 MHz).

	^1H NMR	^{13}C NMR
CH(1)	5.54	132.86
CH(2)	5.65	130.83
CH ₂ (3)	2.22	32.51
CH(4)	2.53	42.51
CH ₂ (5)	1.36,1.46	38.27,37.28
CH(6)	1.87	45.76,46.52
CH(7)	2.08	44.10,45.17
CH ₂ (8)	1.46,1.52	41.53,40.56
CH(9)	3.06	53.31
CH ₂ (10)	1.52,1.18	36.12
CH ₂ (11,14)	1.98	40.82
CH ₂ (12,13)	1.37	47.31
CH ₂ (15,16)	/	30.12
CH ₂ (17)	0.93,1.35	32.82

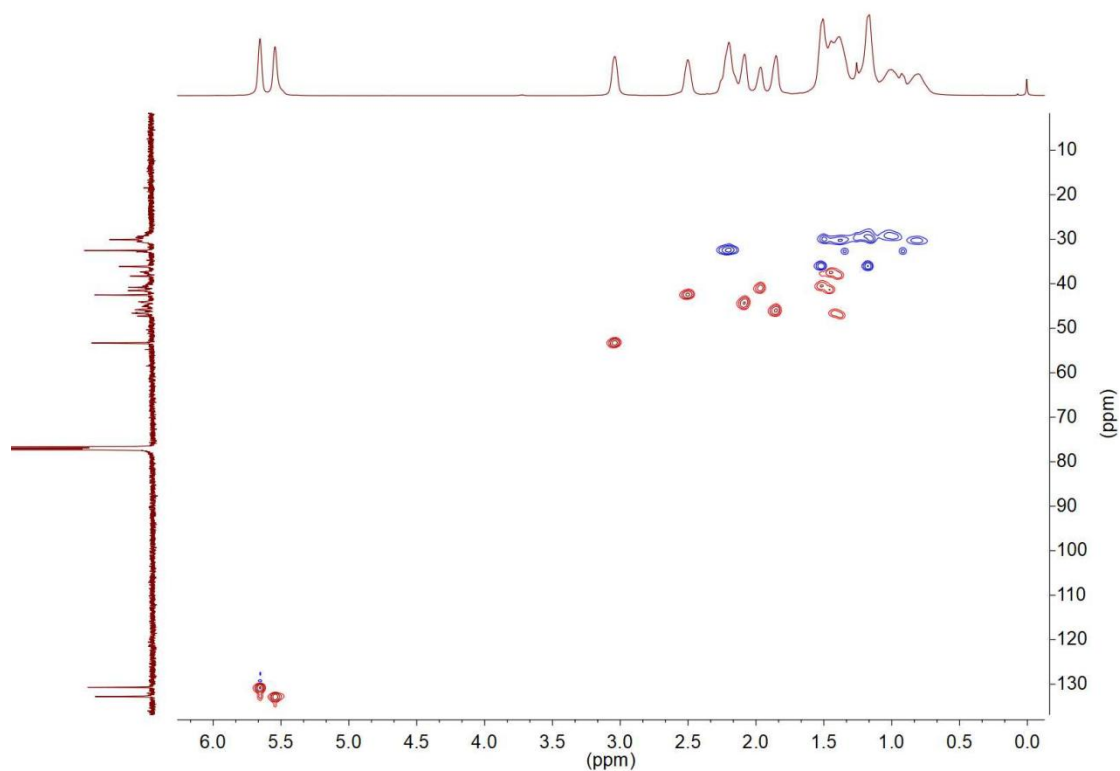


Fig. S55 ^1H - ^{13}C HSQC NMR spectrum of ethylene/norbornene/dicyclopentadiene terpolymer (Table 1, entry 15, CDCl_3 , 25 °C, 500 MHz).

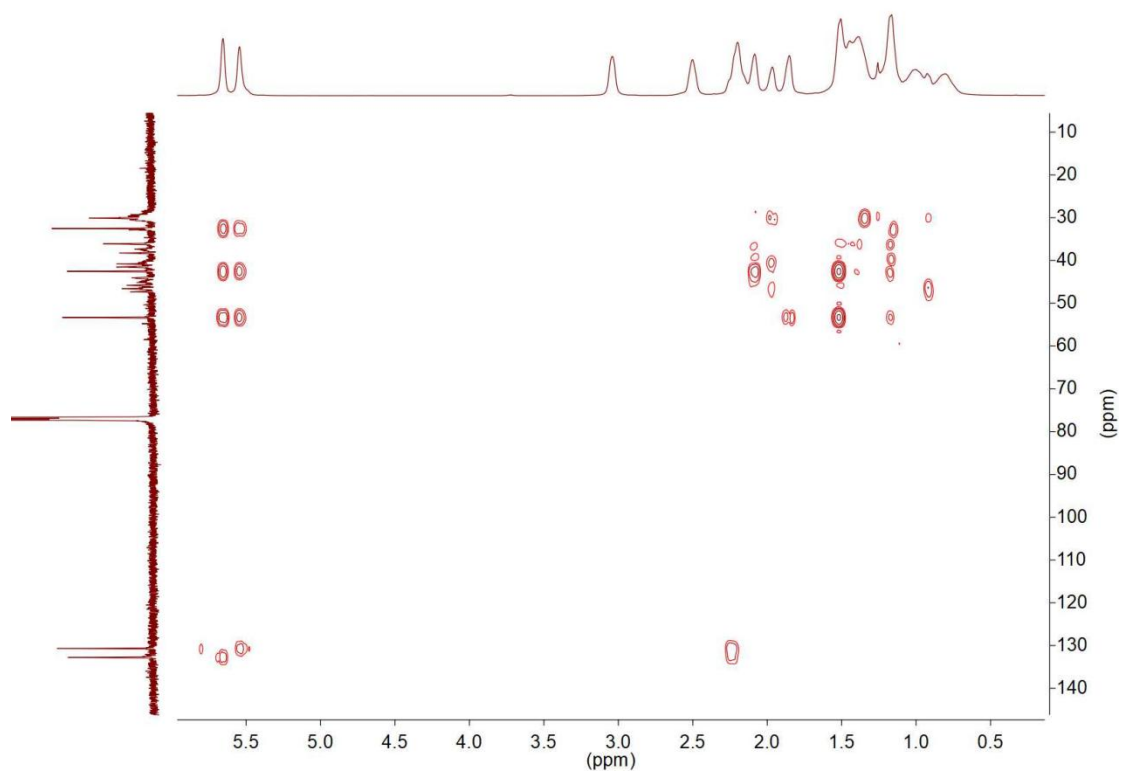


Fig. S56 ^1H - ^{13}C HMBC NMR spectrum of ethylene/norbornene/dicyclopentadiene terpolymer (Table 1, entry 15, CDCl_3 , 25 °C, 500 MHz).

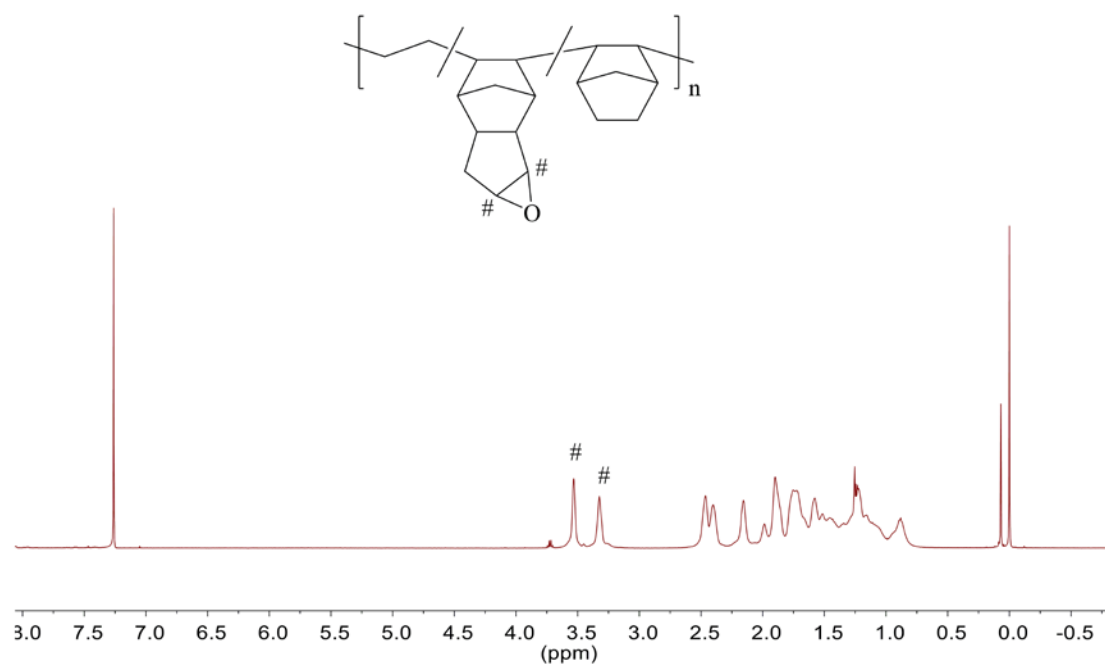


Fig. S57 ^1H spectrum of the product of ethylene/norbornene/dicyclopentadiene terpolymer (Table 1, entry 17) via epoxidation (CDCl_3 , 25 °C, 500 MHz).

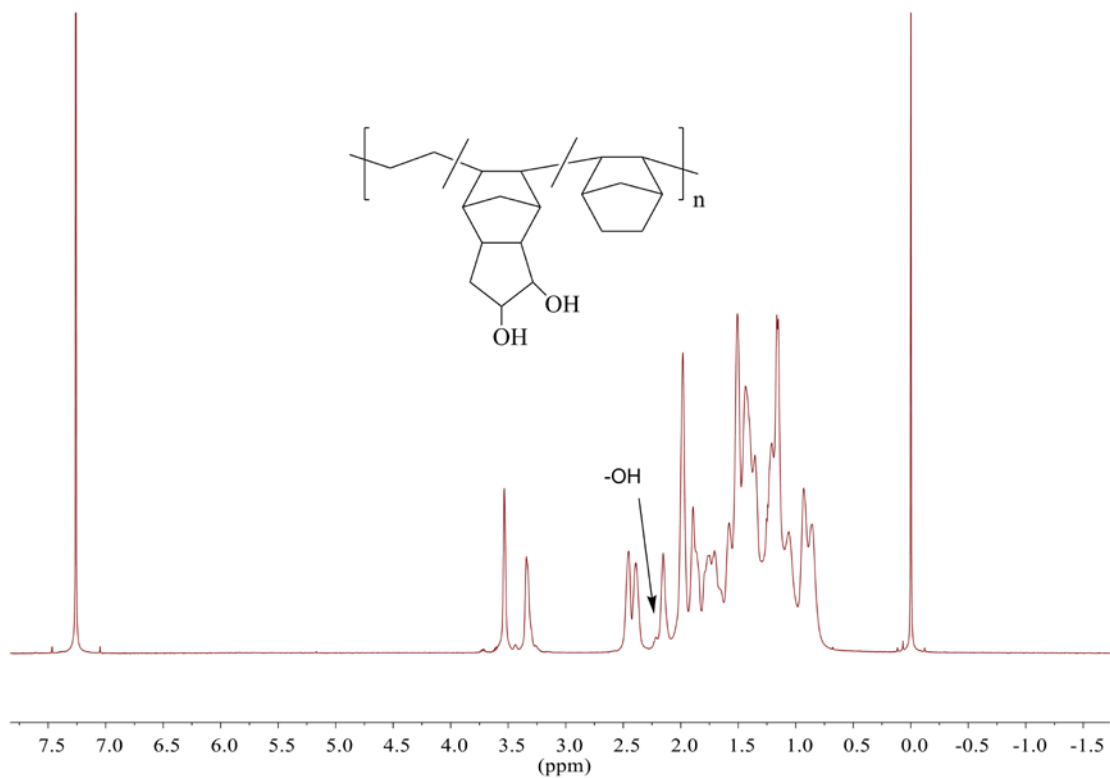


Fig. S58 ^1H spectrum of hydroxylated ethylene/norbornene/dicyclopentadiene terpolymer (Table 1, entry 17) (CDCl_3 , 25°C , 500 MHz).

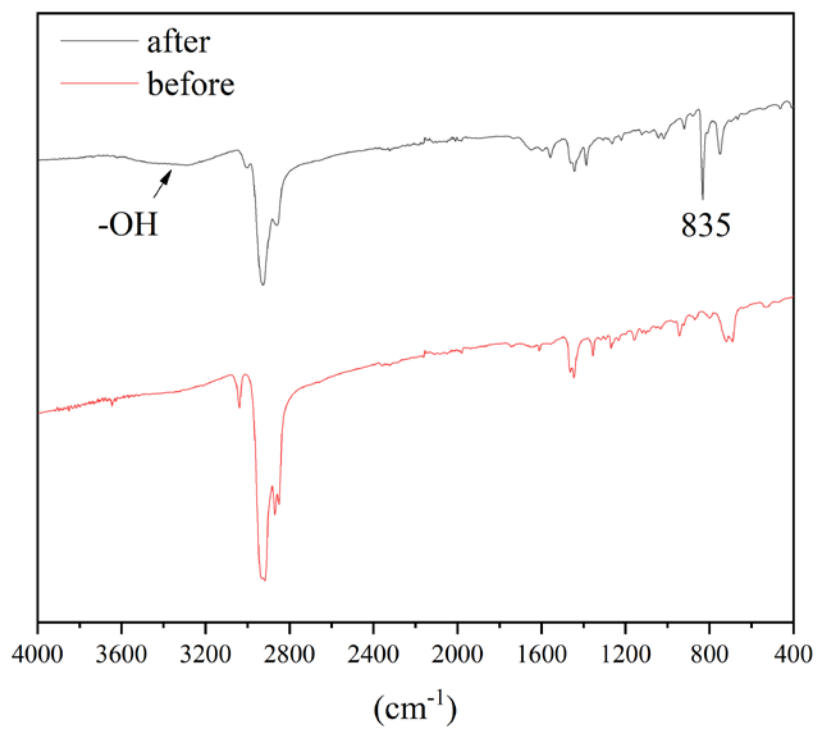


Fig. S59 IR spectra of terpolymer (down, entry 17 in Table 1) and the corresponding hydroxylated product (up).

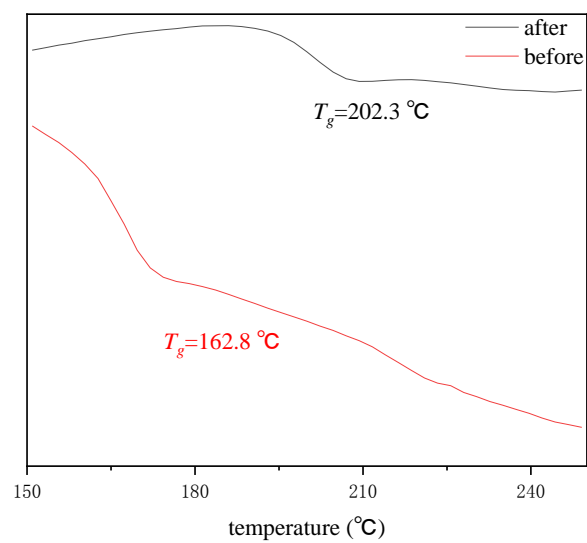


Fig. S60 DSC curves of terpolymer (down, entry 17 in Table 1) and the corresponding hydroxylated product (up).

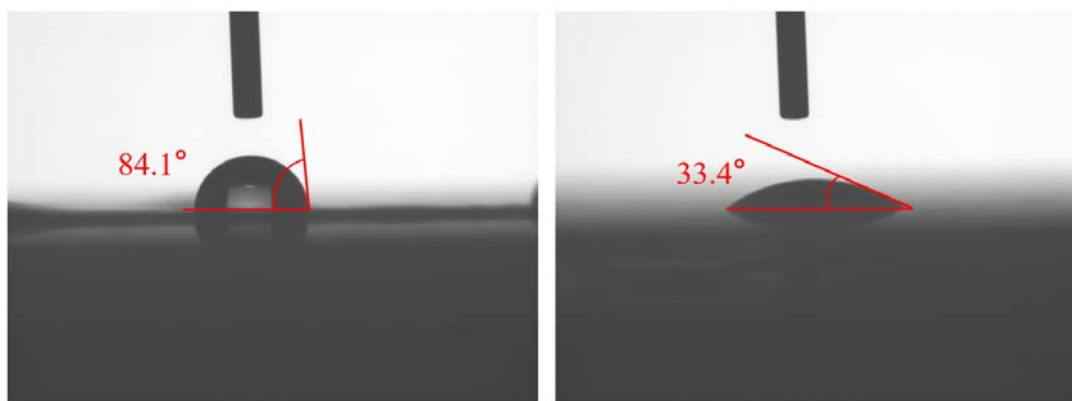


Fig. S61 Water contact angle of terpolymer (left, entry 17 in Table 1) and the corresponding hydroxylated product (right).