Electronic Supplementary Information

Scandium-Catalyzed Copolymerization of Myrcene with Ethylene and Propylene: Convenient Syntheses of Versatile Functionalized Polyolefins

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Content

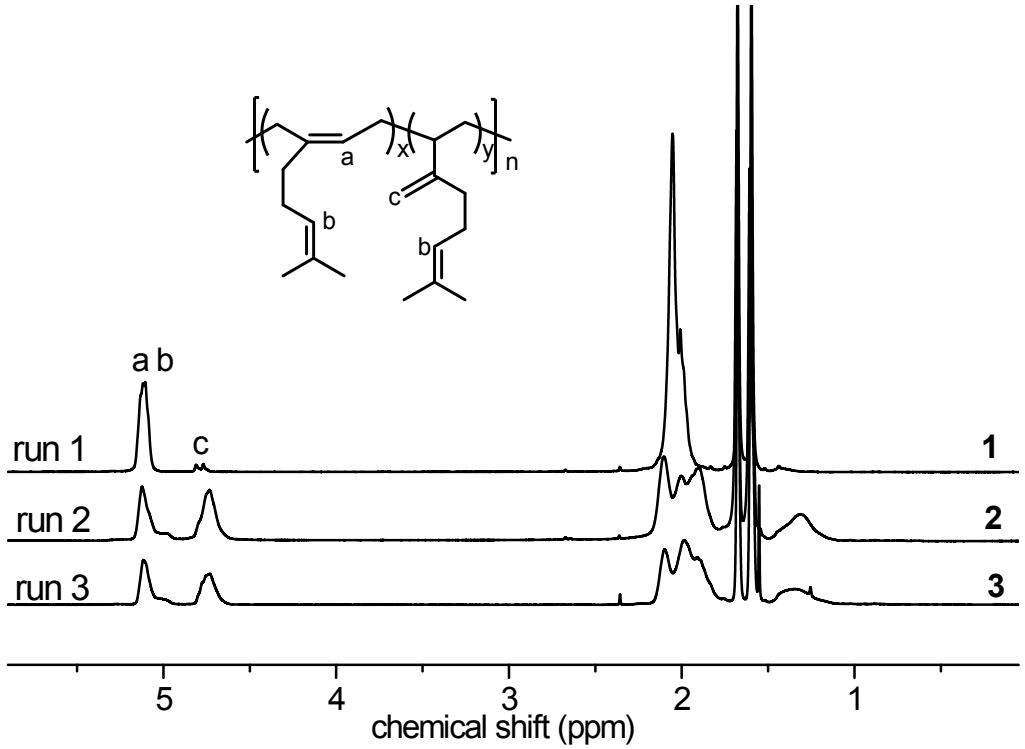

Fig. S1 ^{1}H-NMR spectra (400 MHz, $CDCl_3$, 25 °C) of myrcene homopolymers prepared by **1**–**3** /$[Ph_3C][B(C_6F_5)_4]_3$ (Table 1, runs 1–3).

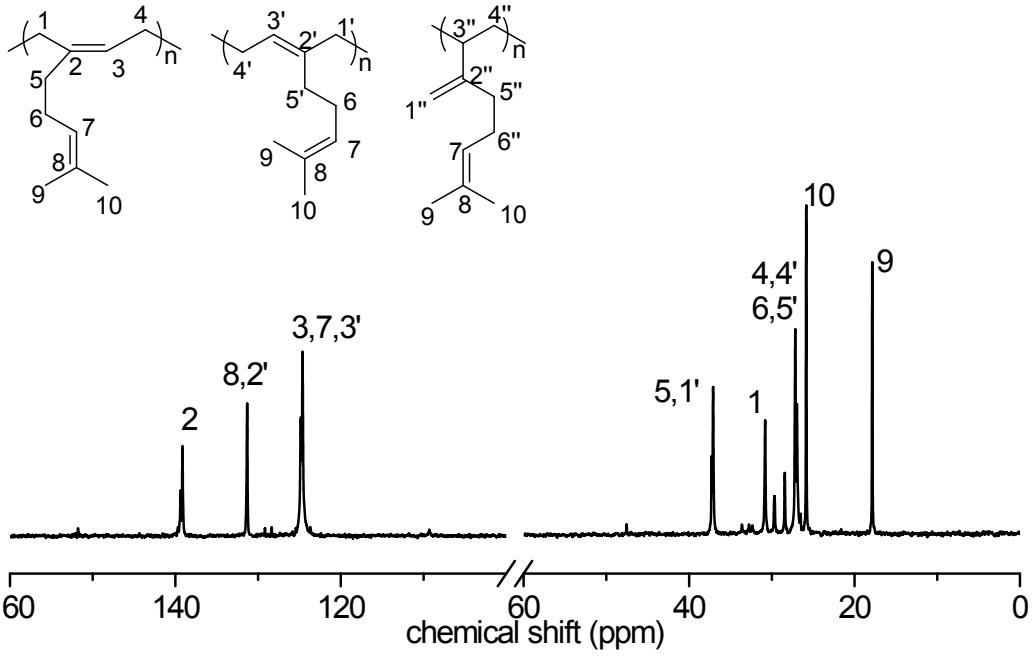

Fig. S2 ^{13}C-NMR spectrum (100 MHz, $CDCl_3$, 25 °C) of a myrcene homopolymer prepared by **1**/$[Ph_3C][B(C_6F_5)_4]_3$ (Table 1, run 1).

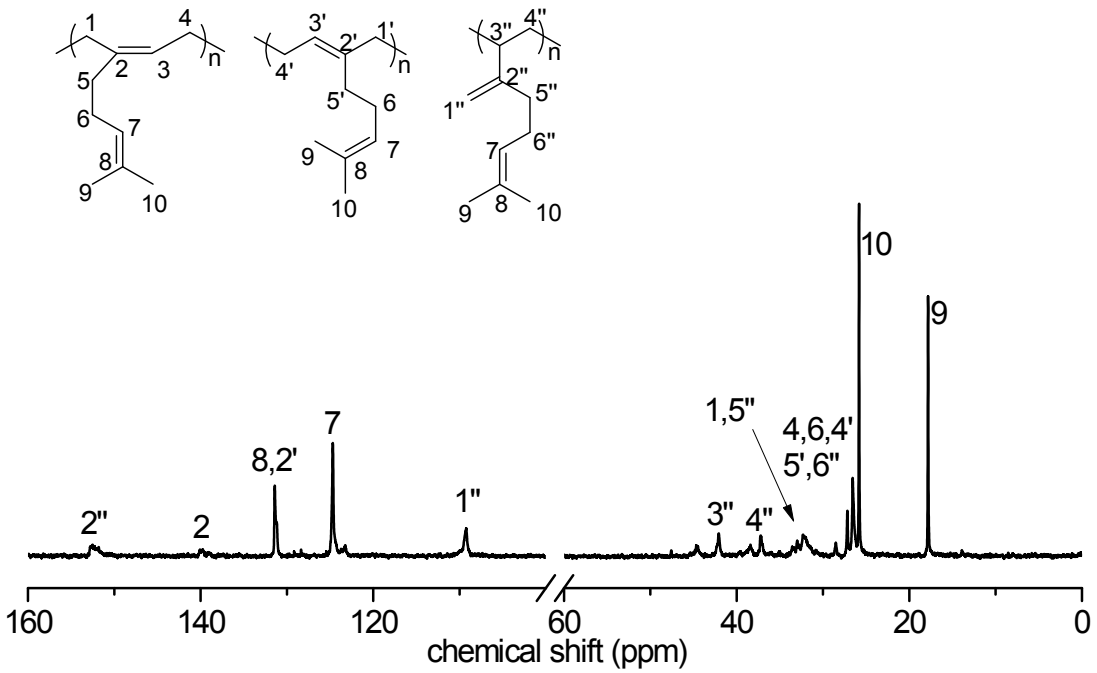

Fig. S3 ^{13}C-NMR spectrum (100 MHz, $CDCl_3$, 25 °C) of a myrcene homopolymer prepared by **2**/$[Ph_3C][B(C_6F_5)_4]_3$ (Table 1, run 2).

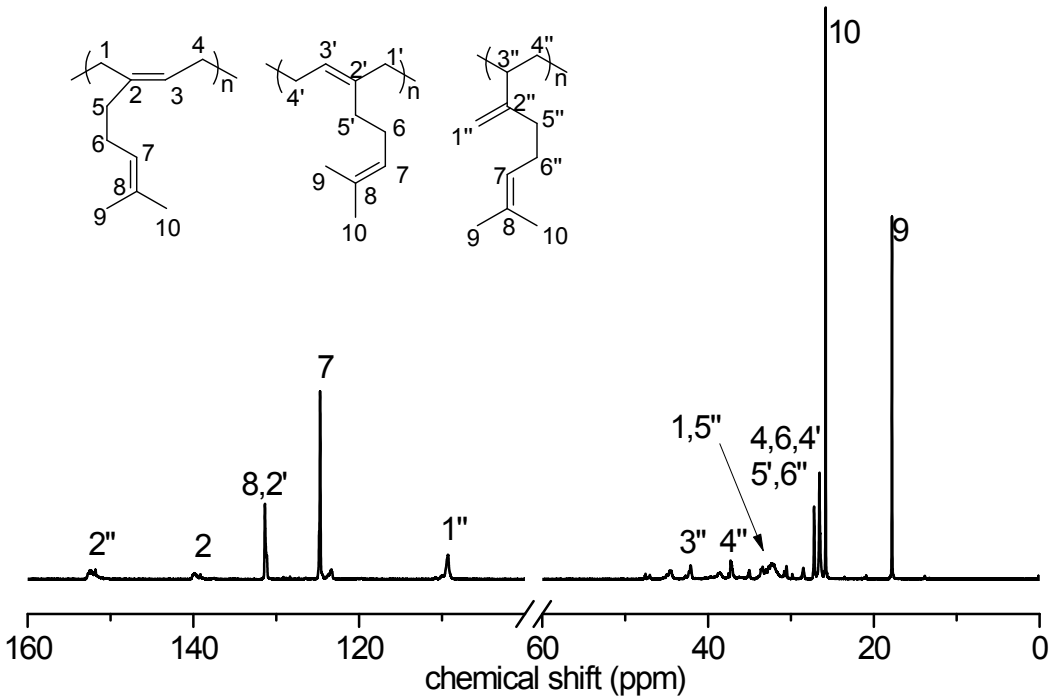

Fig. S4 ^{13}C-NMR spectrum (100 MHz, $CDCl_3$, 25 °C) of a myrcene homopolymer prepared by **3**/$[Ph_3C][B(C_6F_5)_4]_3$ (Table 1, run 3).

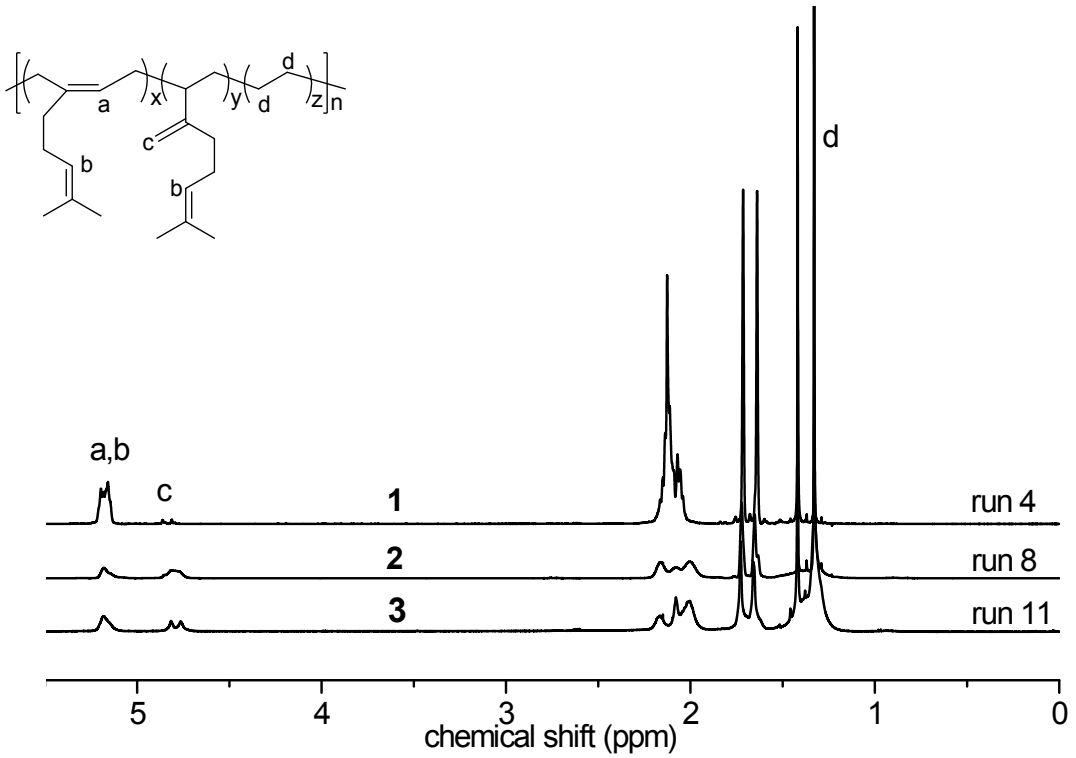

Fig. S5 ^{1}H-NMR spectra (400 MHz, 1,1,2,2-tetrachloroethane-d_2, 100 °C) of myrcene–ethylene copolymers prepared by **1**–**3**/$[Ph_3C][B(C_6F_5)_4]_3$ (Table 1, runs 4, 8, 12).

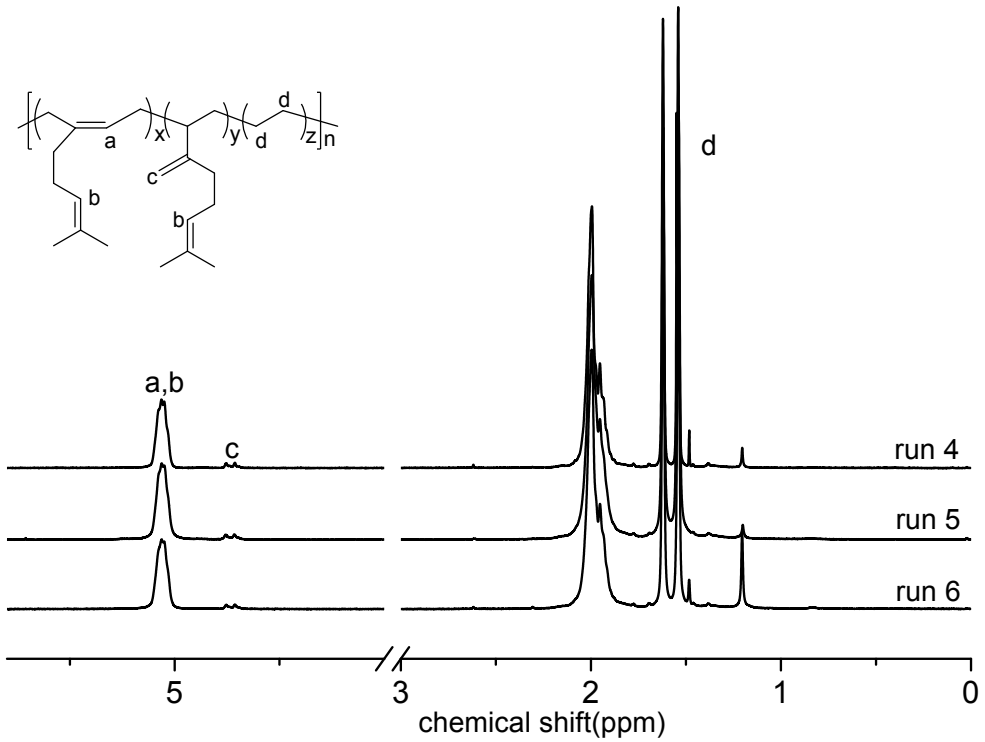

Fig. S6 ^{1}H-NMR spectra (400 MHz, 1,1,2,2-tetrachloroethane-d_2, 100 °C) of myrcene–ethylene copolymers prepared by **1**/$[Ph_3C][B(C_6F_5)_4]_3$ (Table 1, runs 4–6).

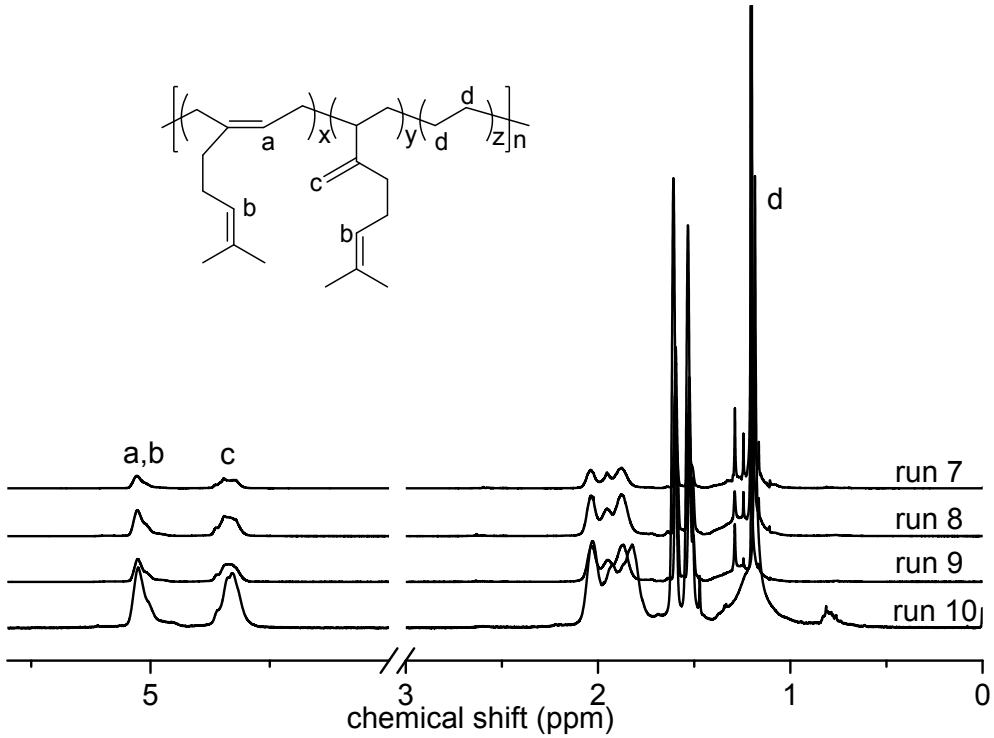

Fig. S7 ^{1}H-NMR spectra (400 MHz, 1,1,2,2-tetrachloroethane-d_2, 100 °C) of myrcene–ethylene copolymers prepared by **2**/$[Ph_3C][B(C_6F_5)_4]_3$ (Table 1, runs 7–10).

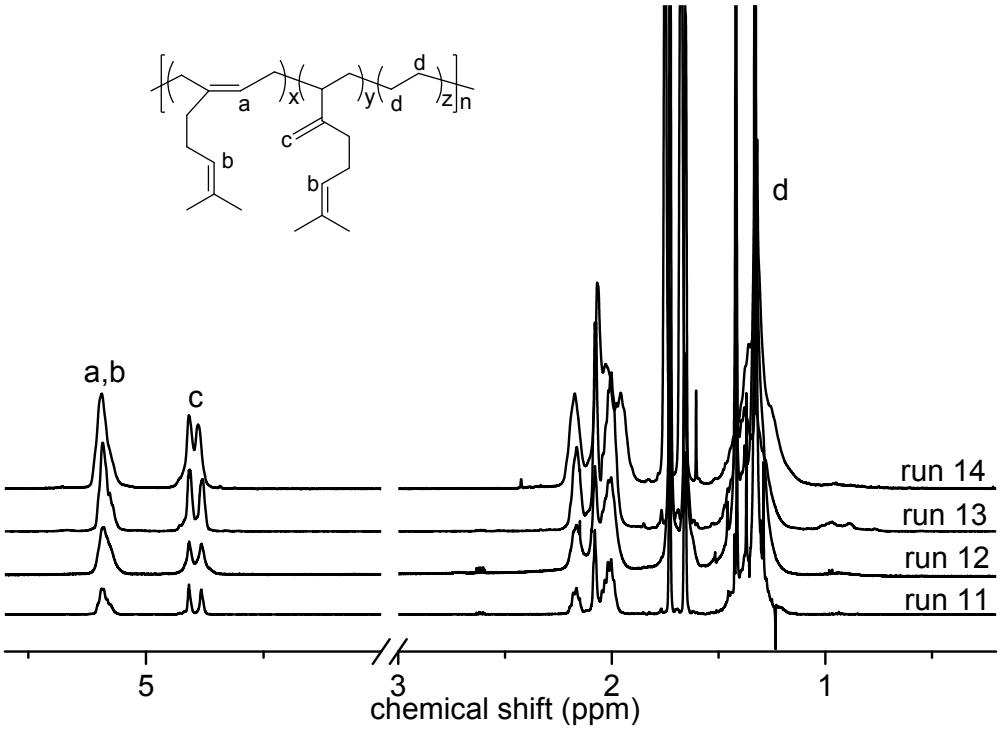

Fig. S8 ^{1}H-NMR spectra (400 MHz, 1,1,2,2-tetrachloroethane-d_2, 100 °C) of myrcene–ethylene copolymers prepared by **3**/$[Ph_3C][B(C_6F_5)_4]_3$(Table 1, runs 11–14).

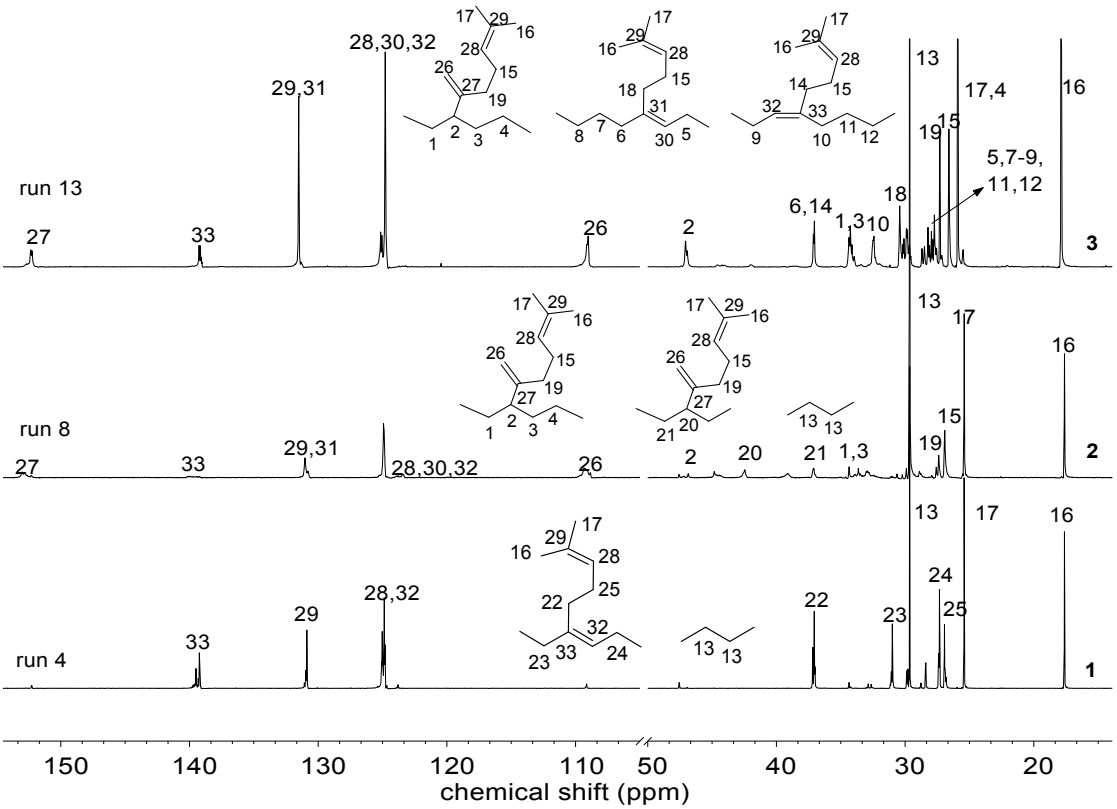

Fig. S9 ^{13}C-NMR spectra (100 MHz, 1,1,2,2-tetrachloroethane-d_2, 100 °C) of myrcene–ethylene copolymers prepared by **1**–**3**/$[Ph_3C][B(C_6F_5)_4]_3$ (Table 1, runs 4, 8, 13).

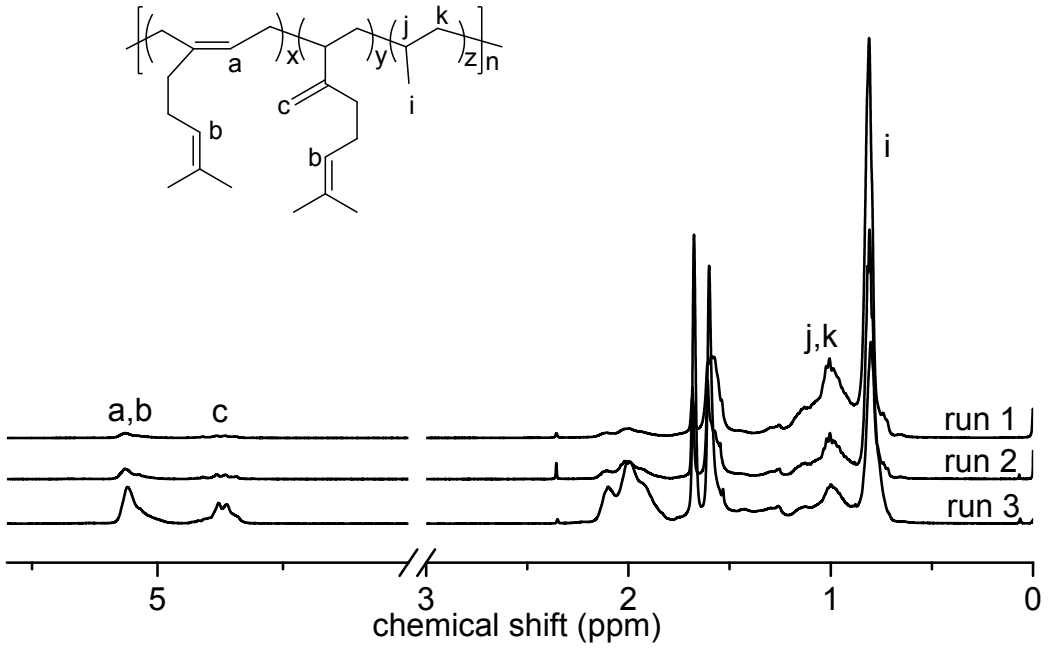

Fig. S10 ^{1}H-NMR spectra (400 MHz, $CDCl_3$, 25 °C) of myrcene–propylene copolymers prepared by **3**/$[Ph_3C][B(C_6F_5)_4]_3$ (Table 2, runs 1–3).

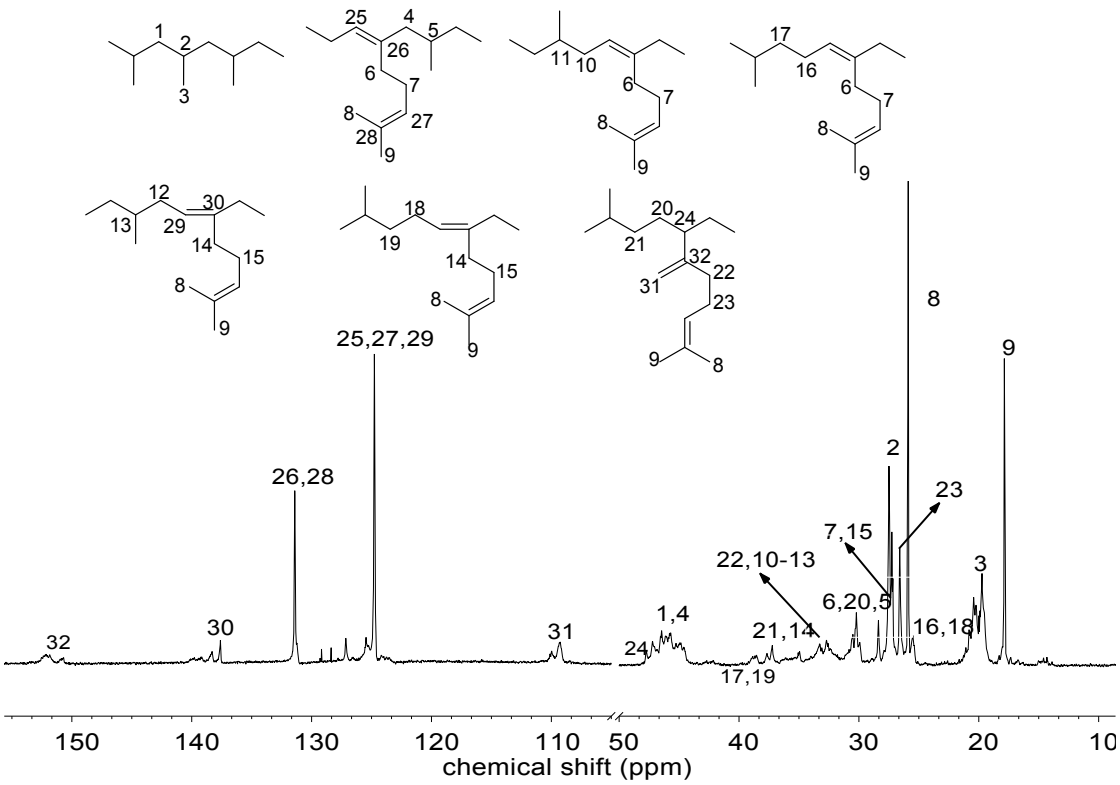

Fig. S11 ^{13}C-NMR spectrum (100 MHz, $CDCl_3$, 25 °C) of a myrcene–propylene copolymer prepared by **3**/$[Ph_3C][B(C_6F_5)_4]_3$ (Table 2, run 3).

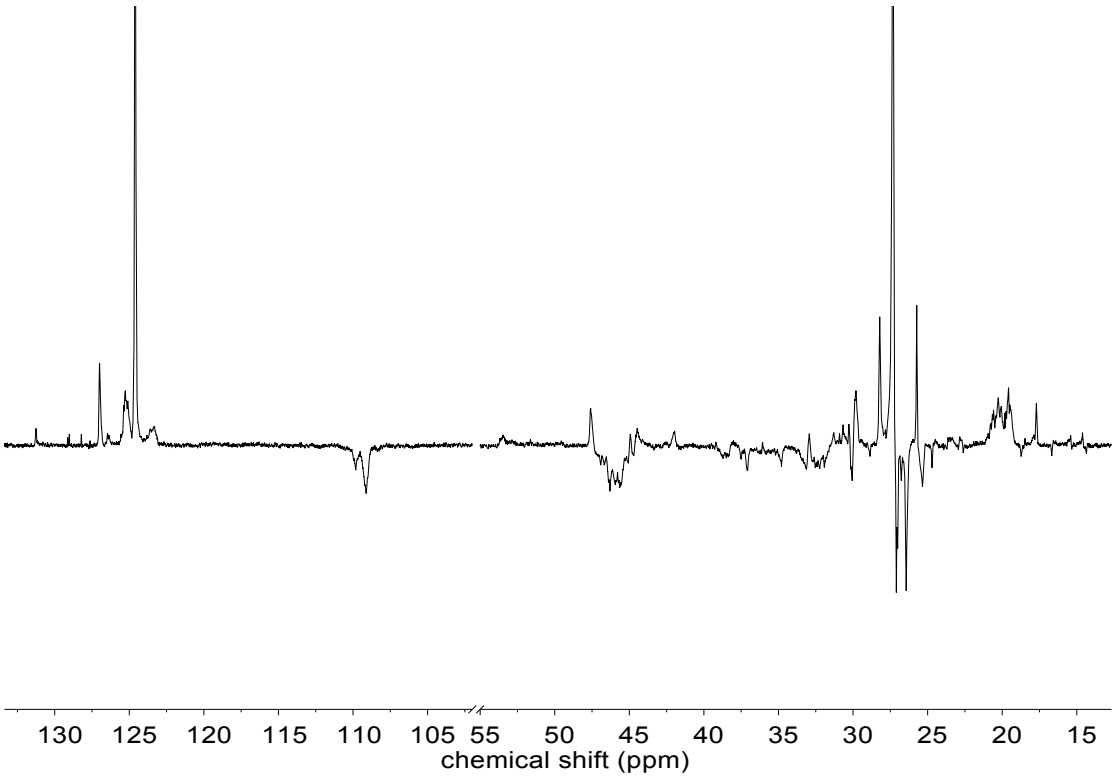

Fig. S12 DEPT135-^{13}C NMR spectrum of a myrcene–propylene copolymer prepared by **3**/$[Ph_3C][B(C_6F_5)_4]_3$ (Table 2, run 3).

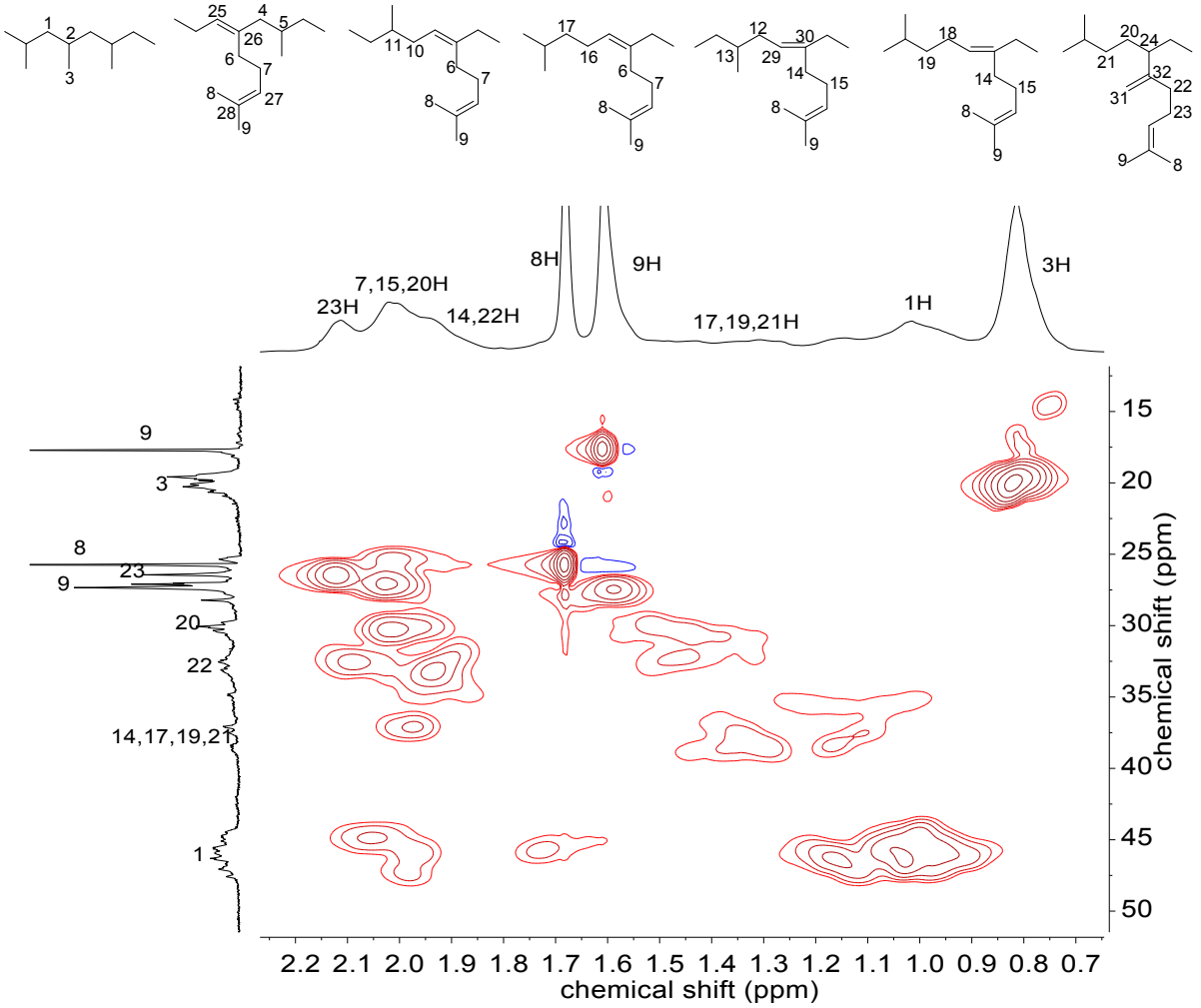

Fig. S13 Aliphatic part of the HMBC NMR spectrum (125 MHz, $CDCl_3$, 25°C) of a myrcene–propylene copolymer prepared by **3**/$[Ph_3C][B(C_6F_5)_4]_3$ (Table 2, run 3).

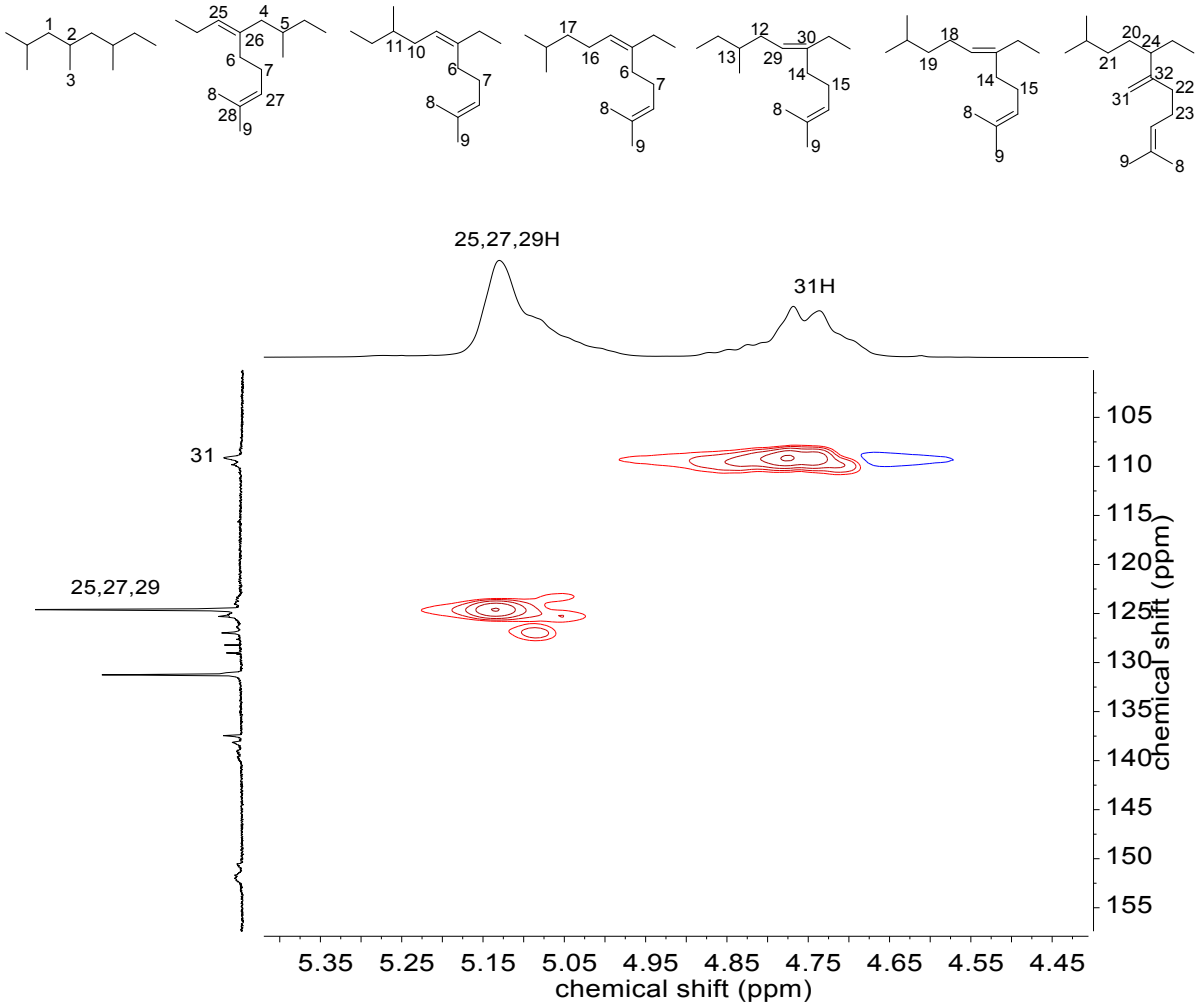

Fig. S14 Olefinic part of the HMBC NMR spectrum (125 MHz, $CDCl_3$, 25°C) of a myrcene–propylene copolymer prepared by **3**/$[Ph_3C][B(C_6F_5)_4]_3$ (Table 2, run 3).

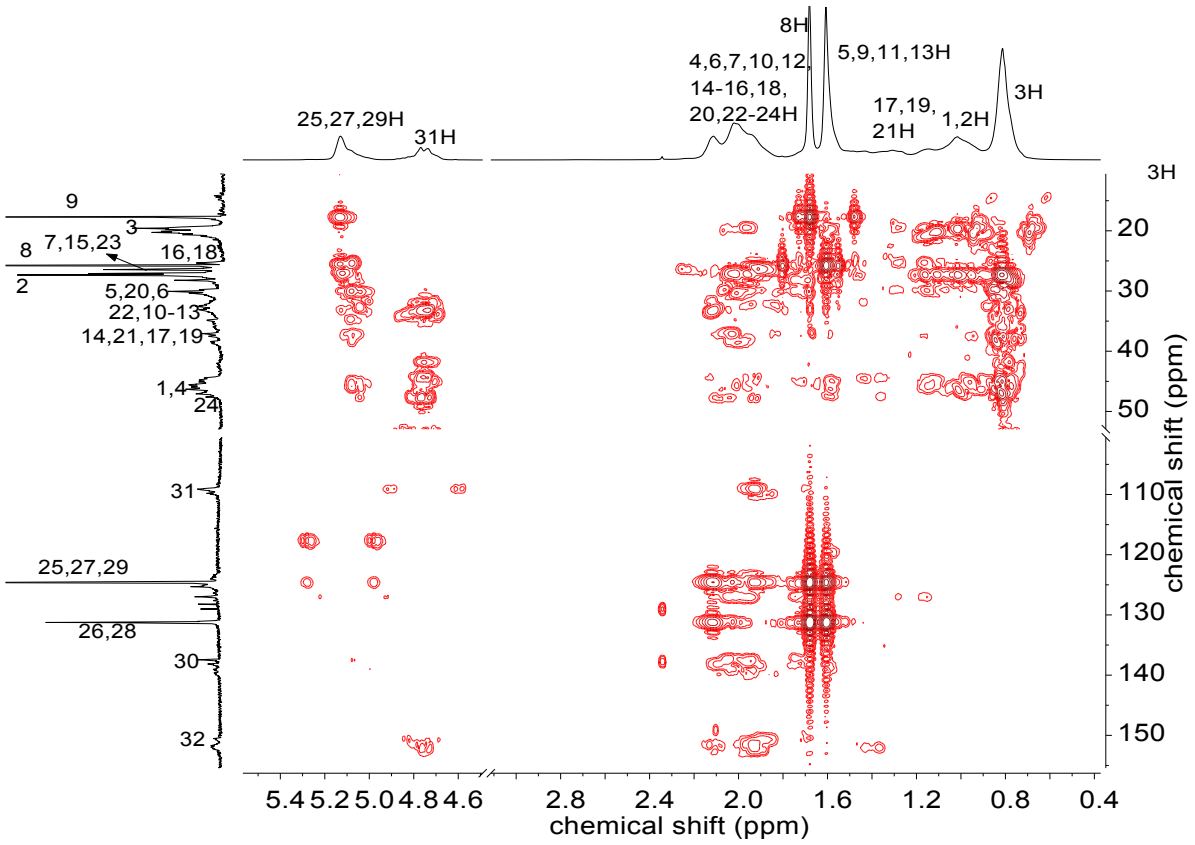

Fig. S15 The HSQC NMR spectrum of a myrcene–propylene copolymer prepared by **3**/$[Ph_3C][B(C_6F_5)_4]_3$ (Table 2, run 3).

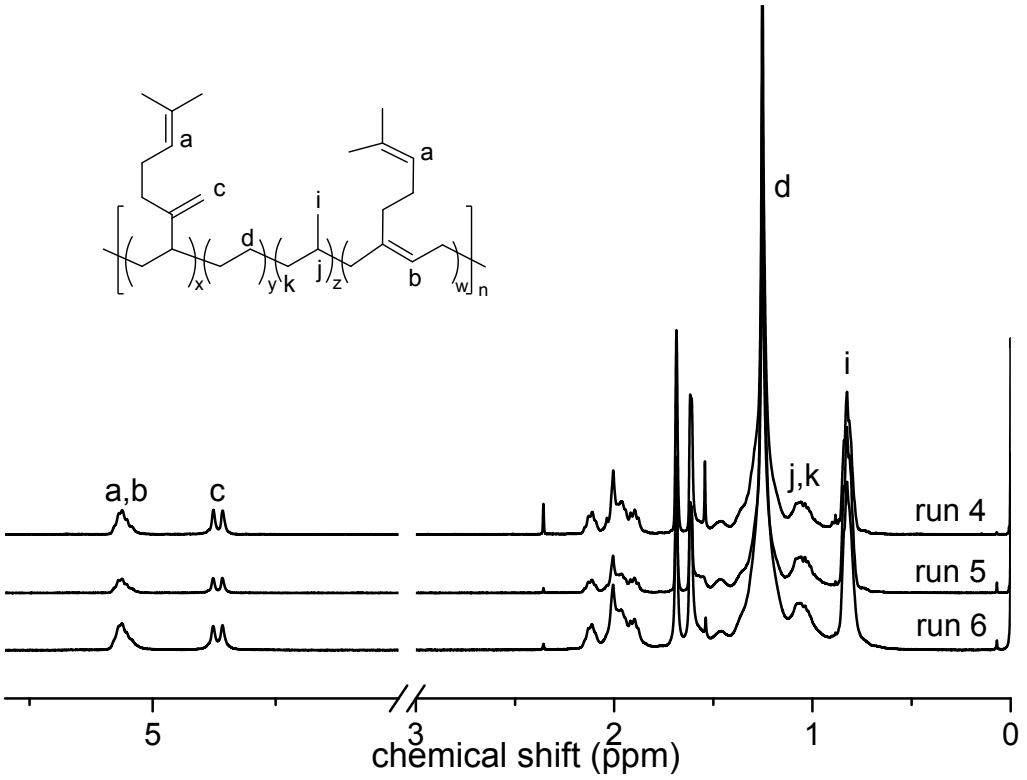

Fig. S16 ^{1}H-NMR spectra (400 MHz, $CDCl_3$, 25 °C) of myrcene–propylene–ethylene terpolymers prepared by **3**/$[Ph_3C][B(C_6F_5)_4]_3$ (Table 2, runs 4–6).

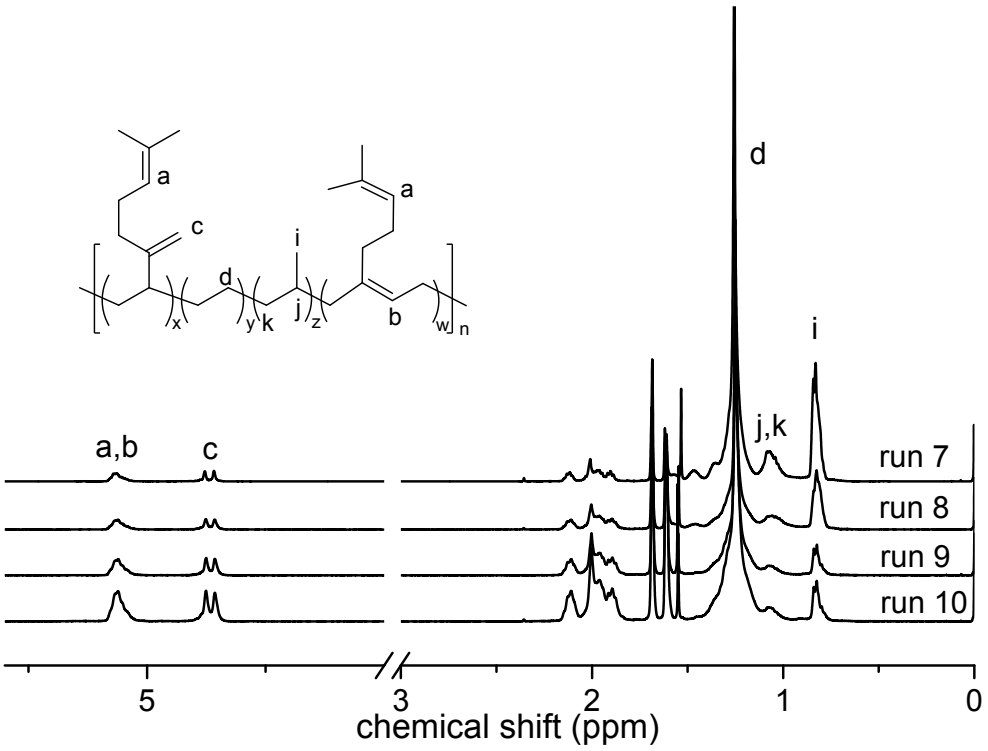

Fig. S17 ^{1}H-NMR spectra (400 MHz, $CDCl_3$, 25 °C) of myrcene–propylene–ethylene terpolymers prepared by **3**/$[Ph_3C][B(C_6F_5)_4]_3$ (Table 2, runs 7–10).

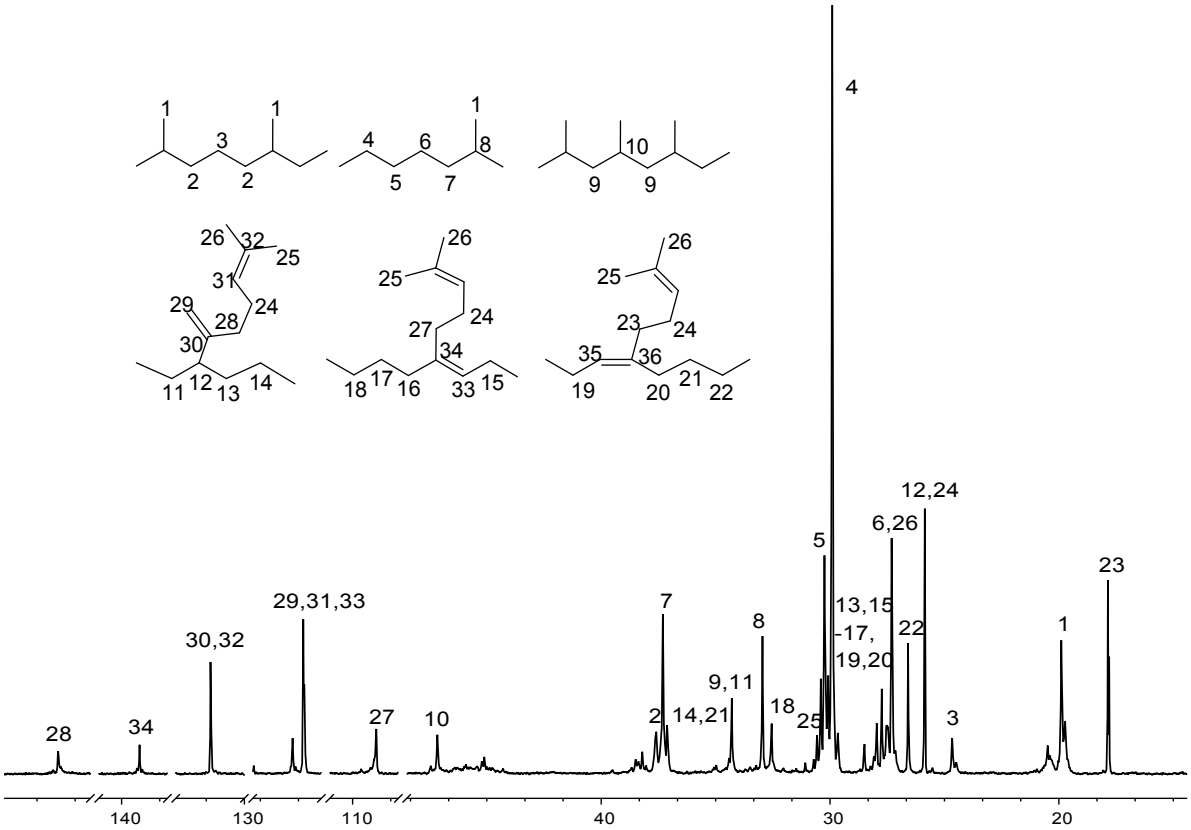

Fig. S18 ^{13}C-NMR spectrum (100 MHz, $CDCl_3$, 25 °C) of an myrcene–propylene–ethylene terpolymer prepared by **3**/$[Ph_3C][B(C_6F_5)_4]_3$ (Table 2, run 6).

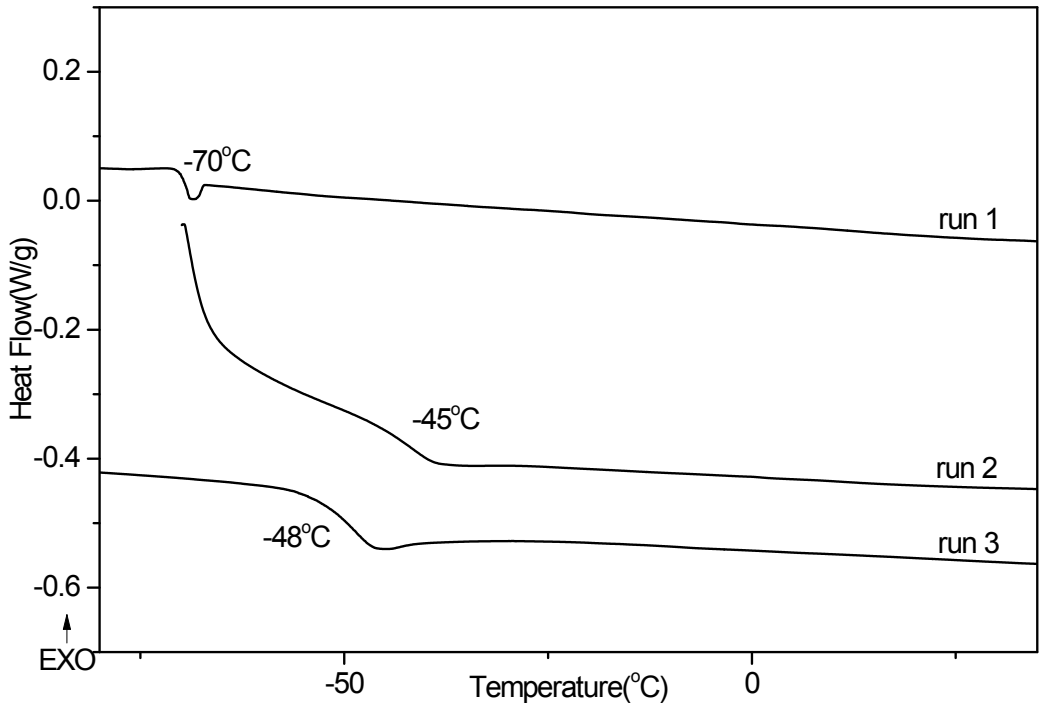

Fig. S19 DSC curves of myrcene homopolymers prepared by **1**–**3**/$[Ph_3C][B(C_6F_5)_4]_3$ (Table 1, runs 1–3).

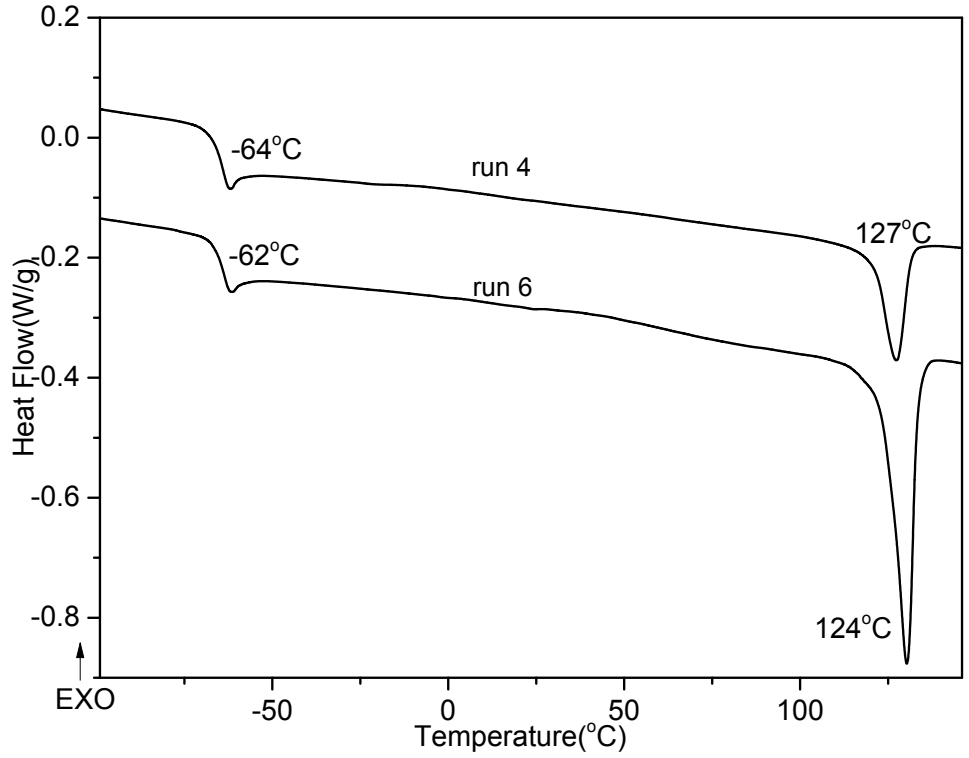

Fig. S20 DSC curves of myrcene–ethylene copolymers prepared by **1**/$[Ph_3C][B(C_6F_5)_4]_3$ (Table 1, runs 4 and 6).

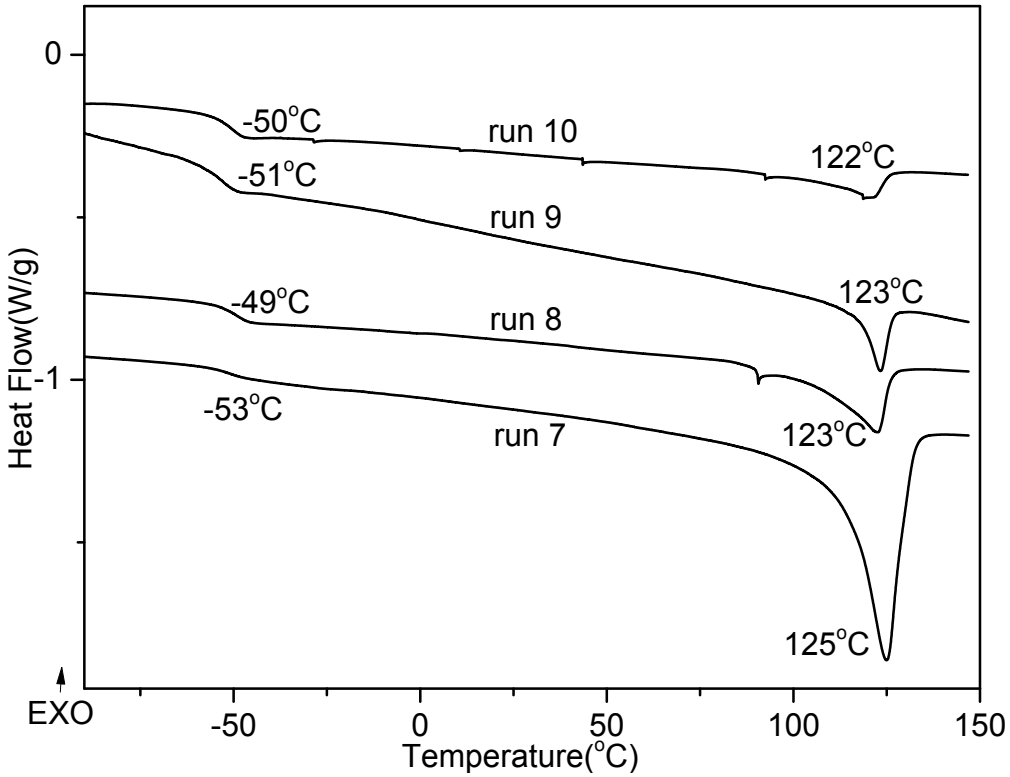

Fig. S21 DSC curves of myrcene–ethylene copolymers prepared by **2**/$[Ph_3C][B(C_6F_5)_4]_3$ (Table 1, runs 7–10).

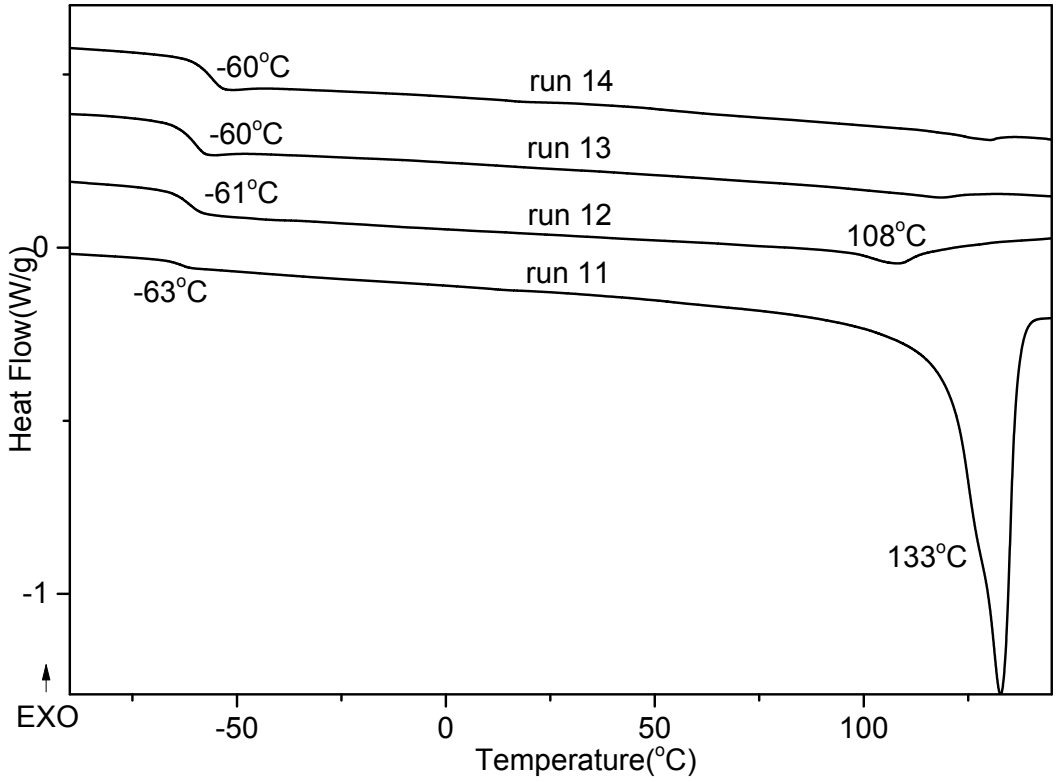

Fig. S22 DSC curves of myrcene–ethylene copolymers prepared by **3**/$[Ph_3C][B(C_6F_5)_4]_3$ (Table 1, runs 11–14).

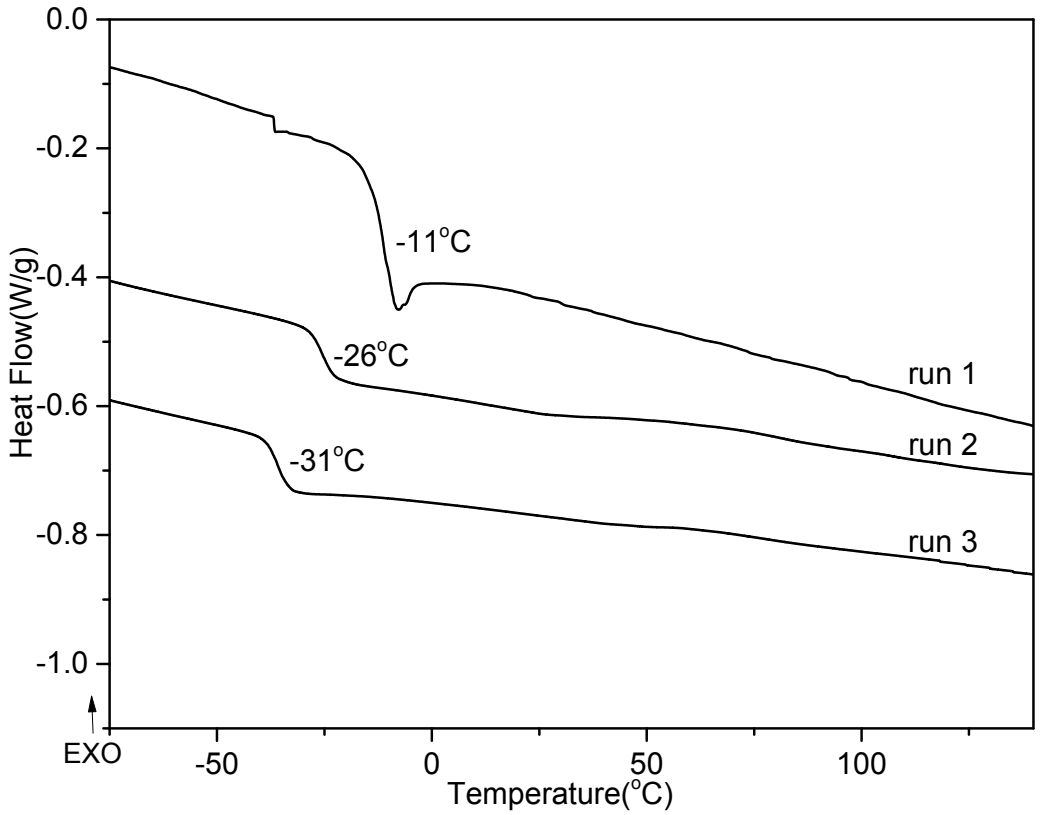

Fig. S23 DSC curves of myrcene–propylene copolymers prepared by **3**/$[Ph_3C][B(C_6F_5)_4]_3$ (Table 2, runs 1–3).

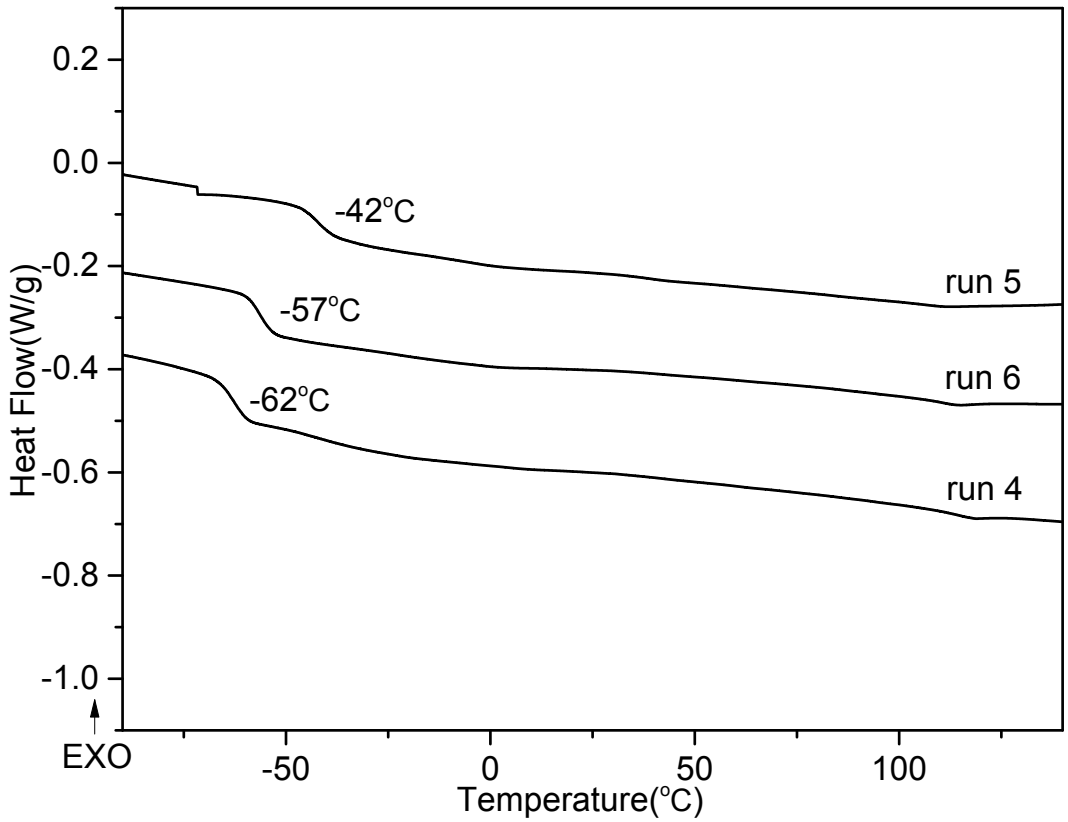

Fig. S24 DSC curves of myrcene–propylene–ethylene terpolymers prepared by **3**/$[Ph_3C][B(C_6F_5)_4]_3$ (Table 2, runs 4–6).

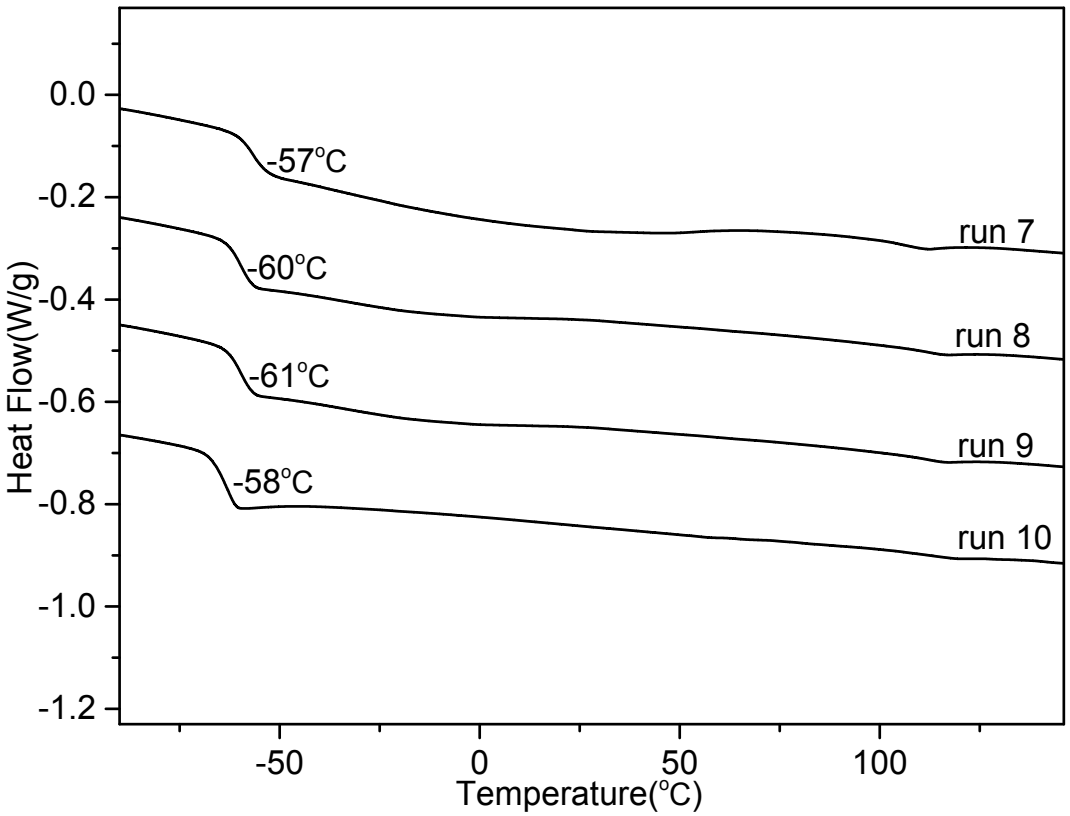

Fig. S25 DSC curves of myrcene–propylene–ethylene terpolymers prepared by **3**/$[Ph_3C][B(C_6F_5)_4]_3$ (Table 2, runs 7–10).

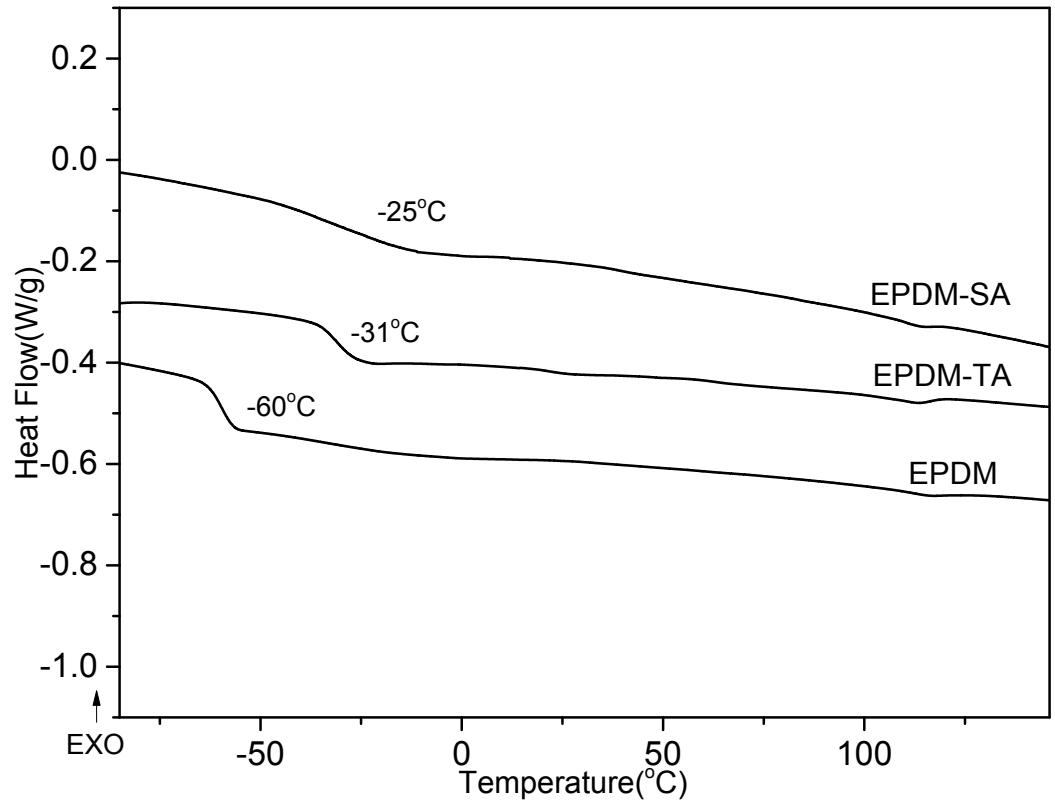

Fig. S26 DSC curves of EPDM, EPDM-TA, EPDM-SA.

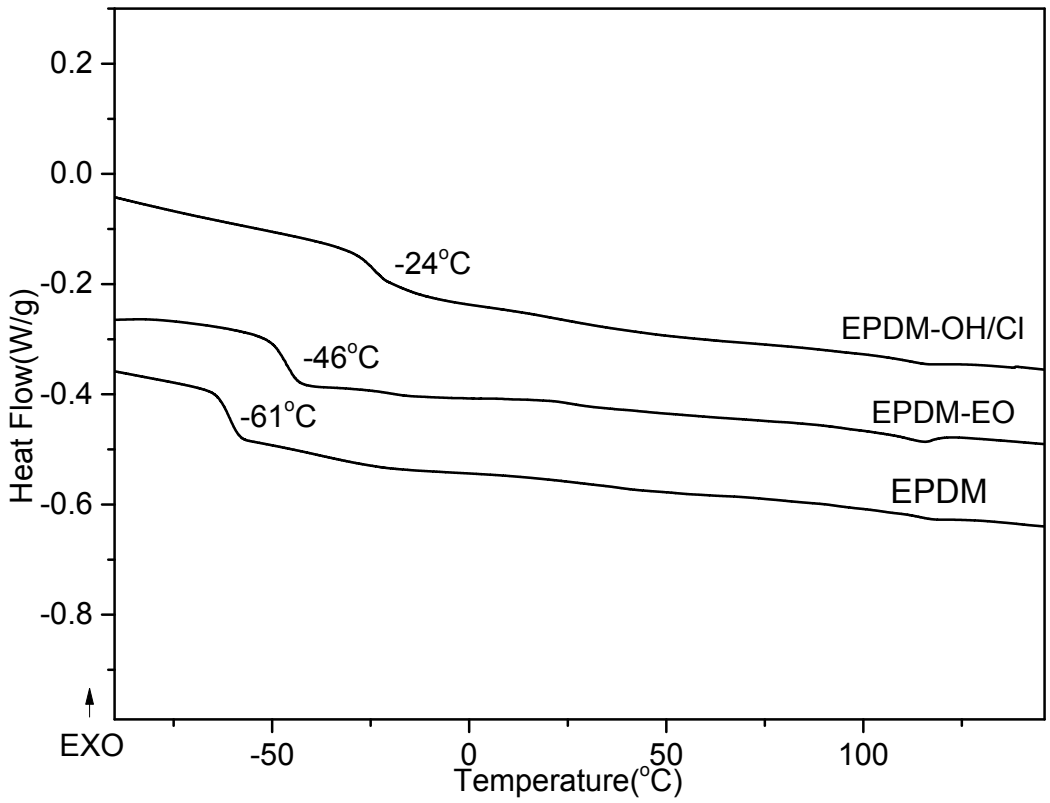

Fig. S27 DSC curves of EPDM, EPDM-EO, EPDM-OH/Cl.

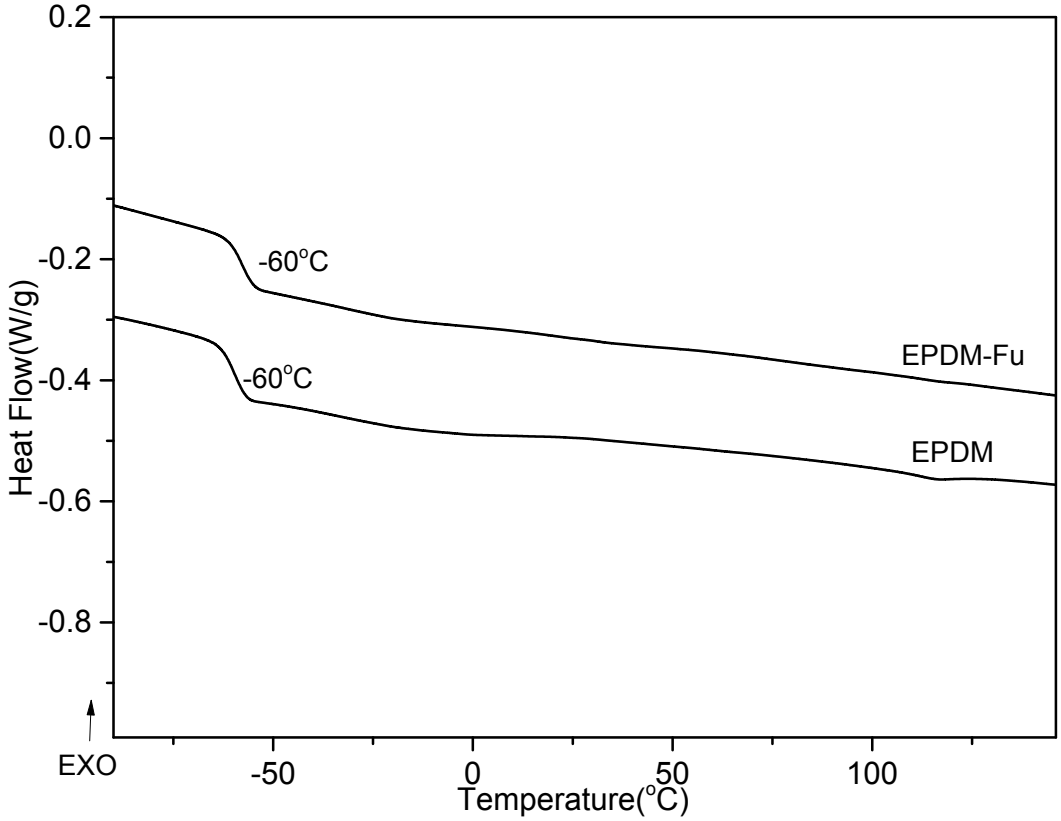

Fig. S28 DSC curves of EPDM and EPDM-Fu.

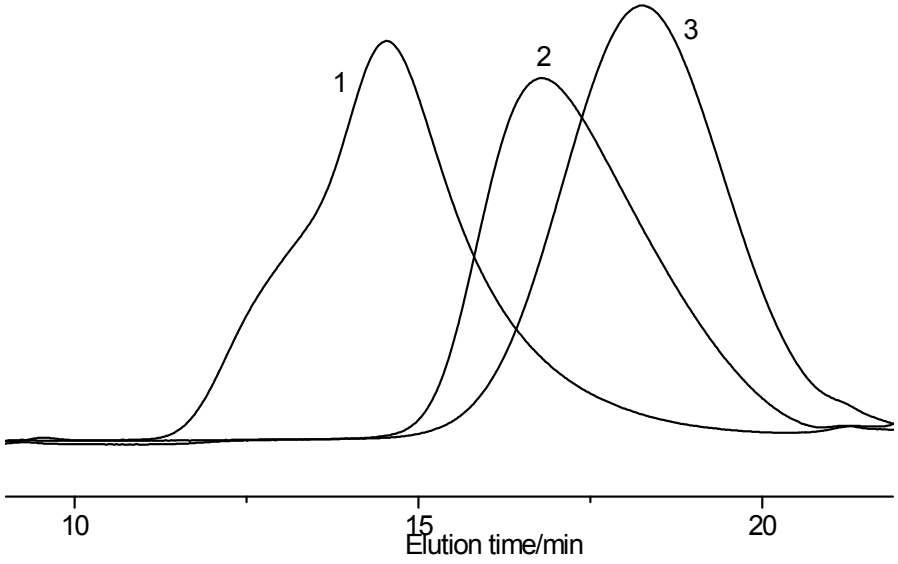

Fig. S29 GPC curves of myrcene homopolymers prepared by **1**–**3**/$[Ph_3C][B(C_6F_5)_4]_3$(Table 1, runs 1–3).

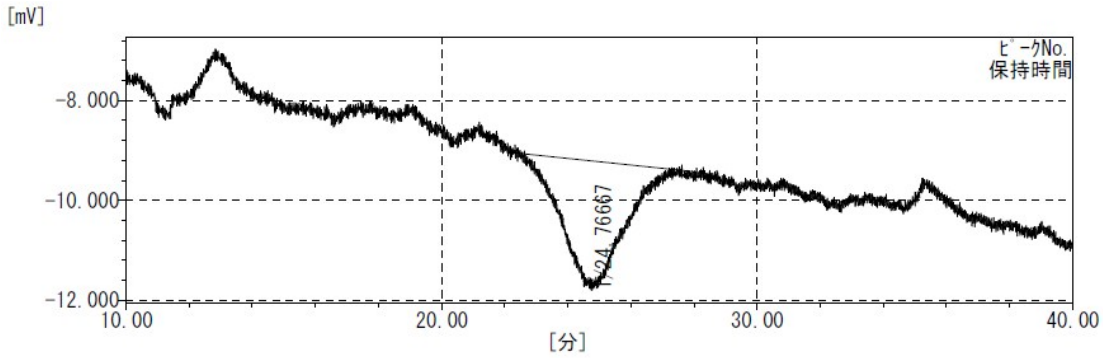

Fig. S30 GPC curve of a myrcene–ethylene copolymer prepared by **1**/$[Ph_3C][B(C_6F_5)_4]_3$ (Table 1, run 6).

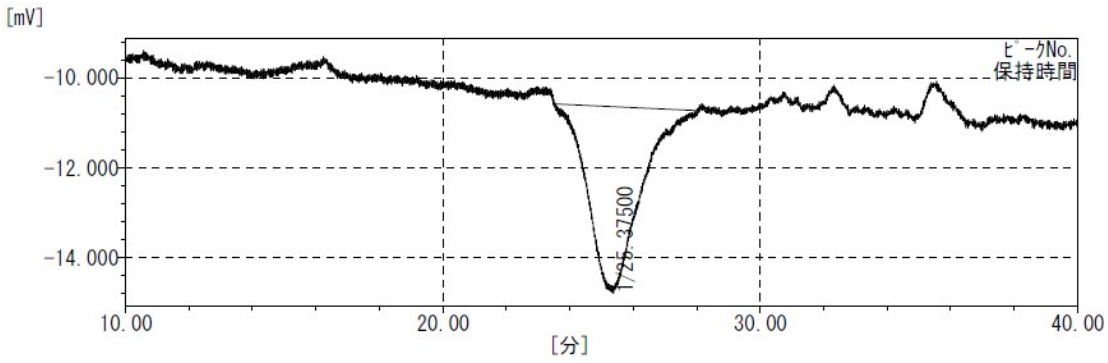

Fig. S31 GPC curve of a myrcene–ethylene copolymer prepared by **2**/$[Ph_3C][B(C_6F_5)_4]_3$ (Table 1, run 9).

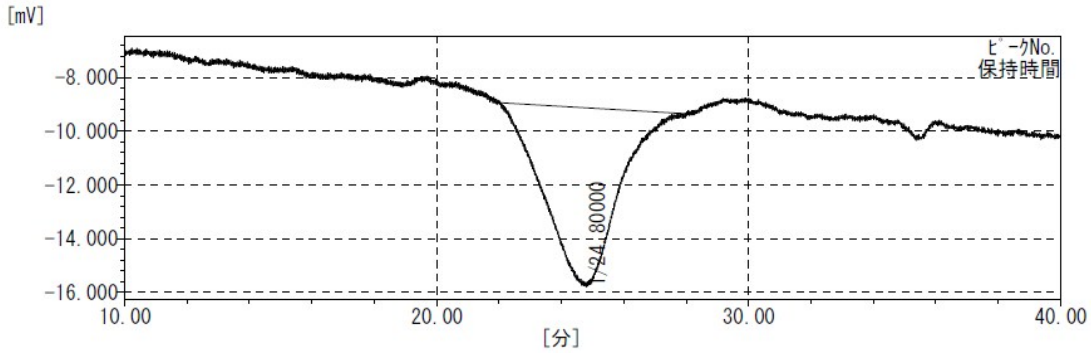

Fig. S32 GPC curve of a myrcene–ethylene copolymer prepared by **3**/$[Ph_3C][B(C_6F_5)_4]_3$ (Table 1, run 13).

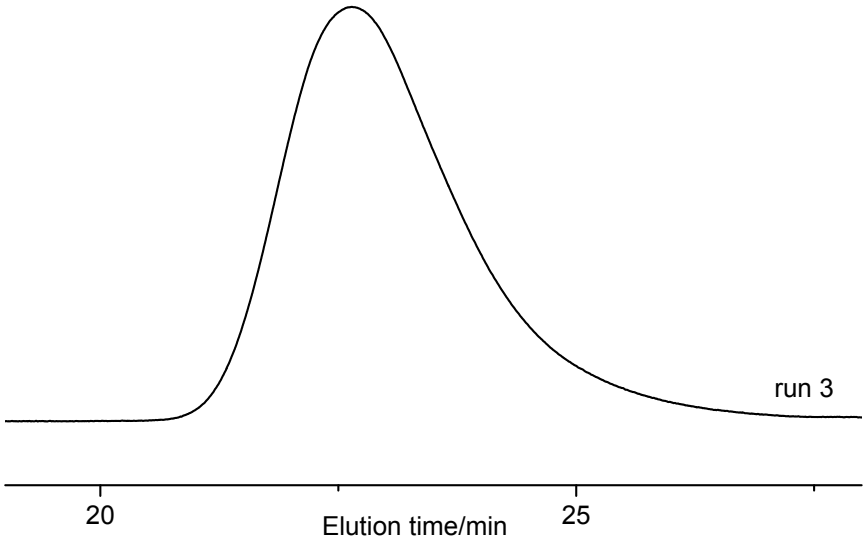

Fig. S33 GPC curve of a myrcene–propylene copolymer prepared by **3**/$[Ph_3C][B(C_6F_5)_4]_3$ (Table 2, run 3).

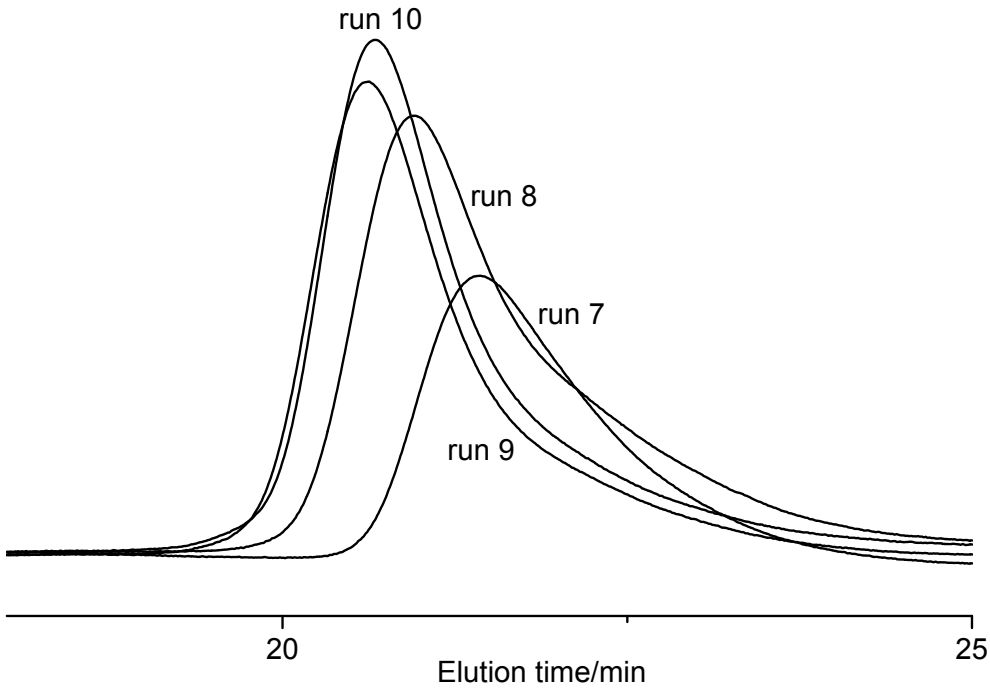

Fig. S34 GPC curves of myrcene–propylene–ethylene terpolymers prepared by **3**/$[Ph_3C][B(C_6F_5)_4]_3$ (Table 2, runs 7–10).