

Electronic Supplementary Information

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

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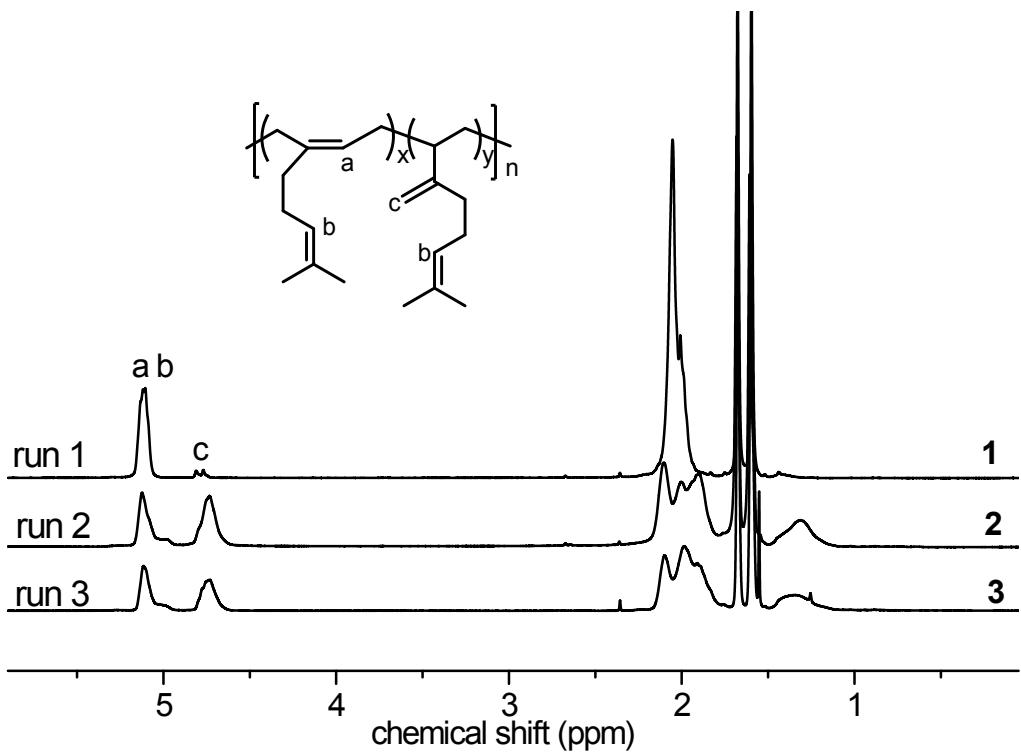


Fig. S1 ¹H-NMR spectra (400 MHz, CDCl₃, 25 °C) of myrcene homopolymers prepared by **1–3** /[Ph₃C][B(C₆F₅)₄]₃ (Table 1, runs 1–3).

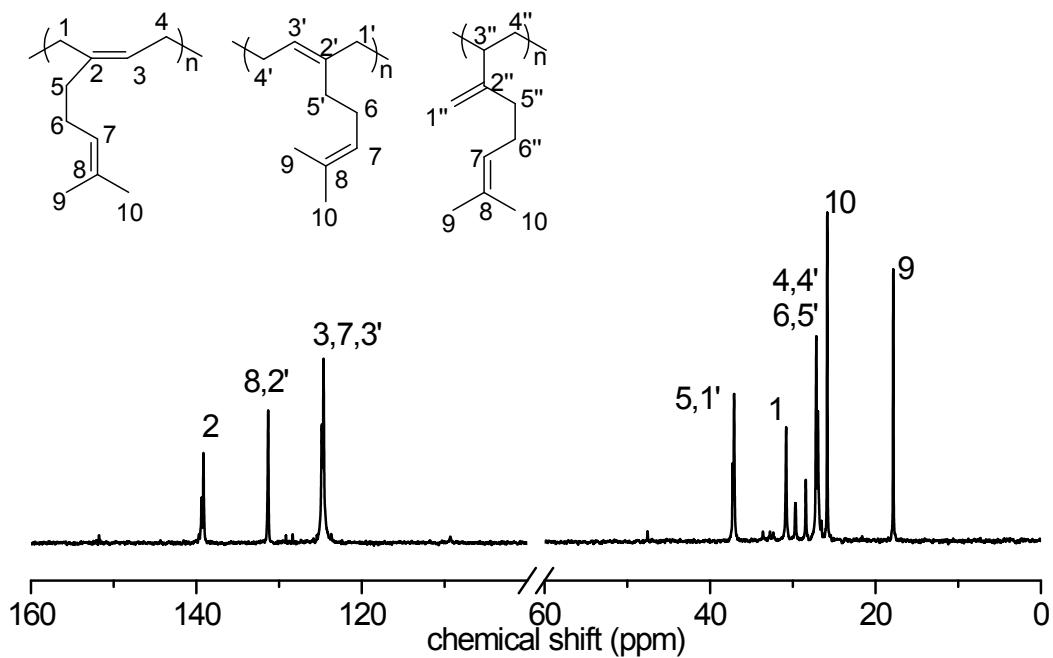


Fig. S2 ¹³C-NMR spectrum (100 MHz, CDCl₃, 25 °C) of a myrcene homopolymer prepared by **1**/[Ph₃C][B(C₆F₅)₄]₃ (Table 1, run 1).

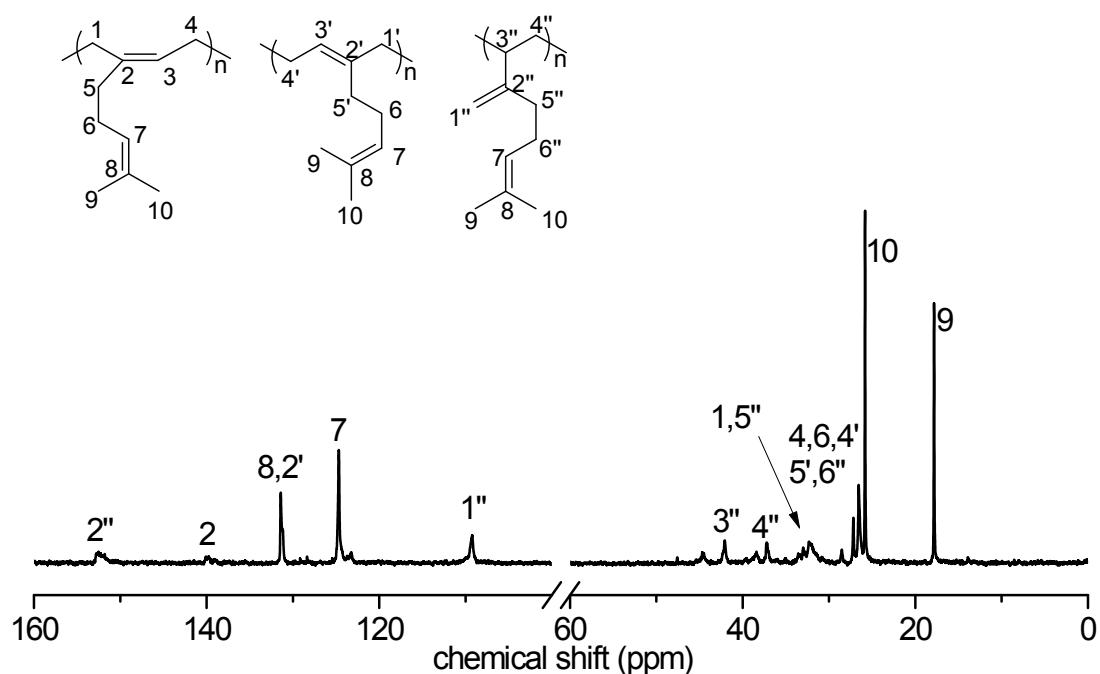


Fig. S3 ^{13}C -NMR spectrum (100 MHz, CDCl_3 , 25 °C) of a myrcene homopolymer prepared by **2**/[Ph_3C][$\text{B}(\text{C}_6\text{F}_5)_4$]₃ (Table 1, run 2).

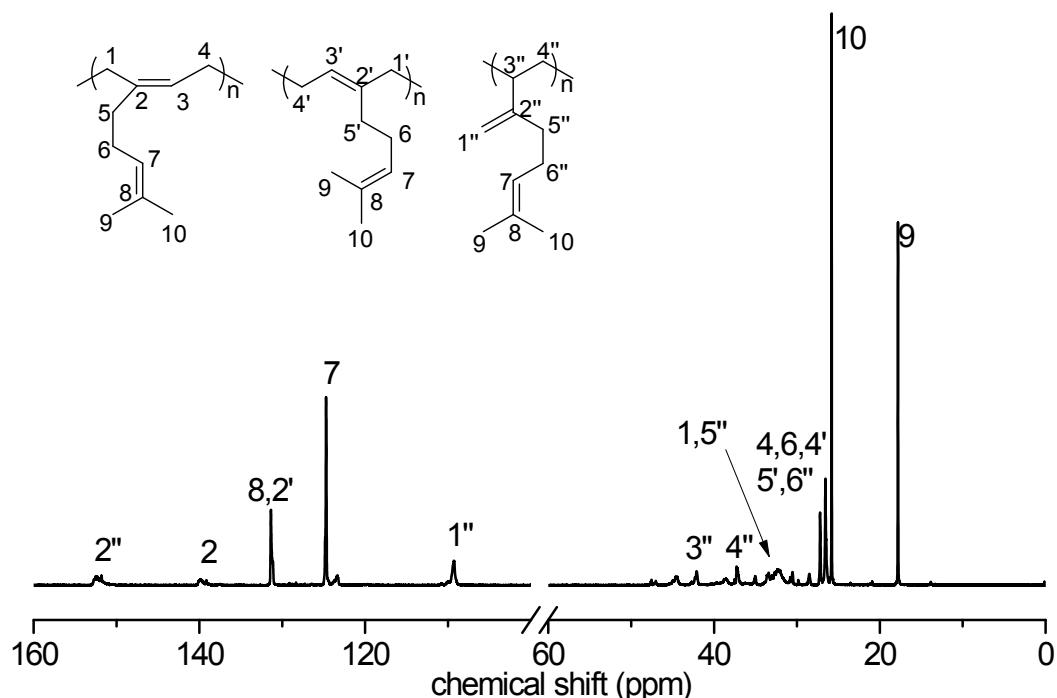


Fig. S4 ^{13}C -NMR spectrum (100 MHz, CDCl_3 , 25 °C) of a myrcene homopolymer prepared by **3**/[Ph_3C][$\text{B}(\text{C}_6\text{F}_5)_4$]₃ (Table 1, run 3).

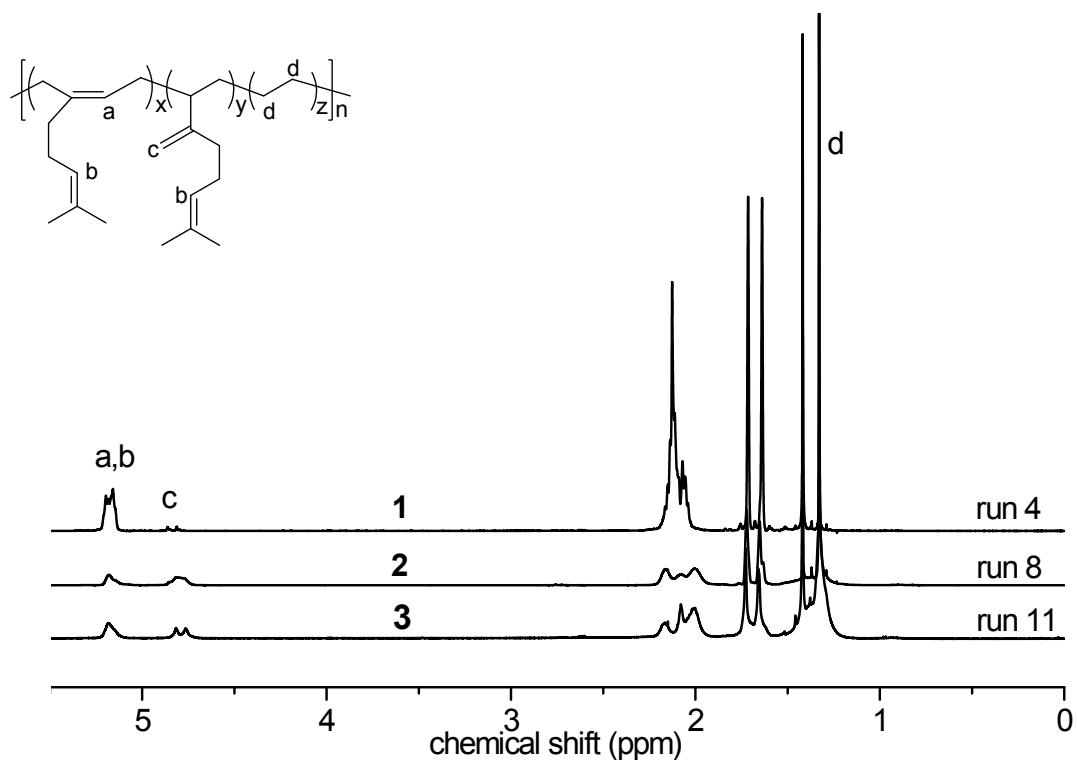


Fig. S5 ¹H-NMR spectra (400 MHz, 1,1,2,2-tetrachloroethane-*d*₂, 100 °C) of myrcene–ethylene copolymers prepared by **1–3**/[Ph₃C][B(C₆F₅)₄]₃ (Table 1, runs 4, 8, 12).

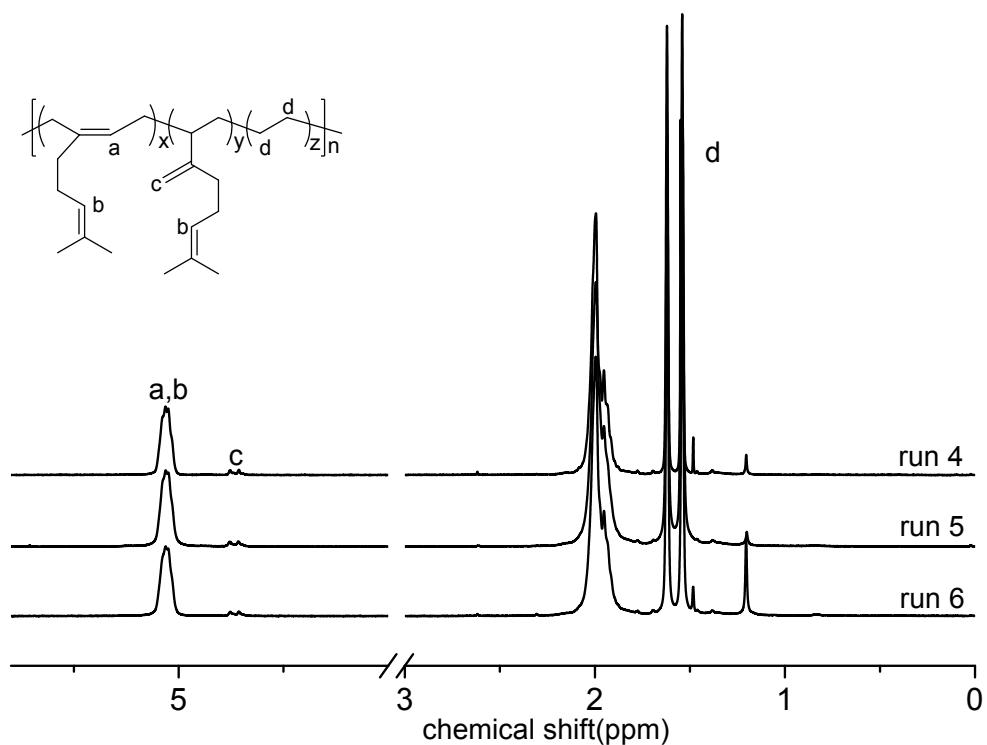


Fig. S6 ¹H-NMR spectra (400 MHz, 1,1,2,2-tetrachloroethane-*d*₂, 100 °C) of myrcene–ethylene copolymers prepared by **1**/[Ph₃C][B(C₆F₅)₄]₃ (Table 1, runs 4–6).

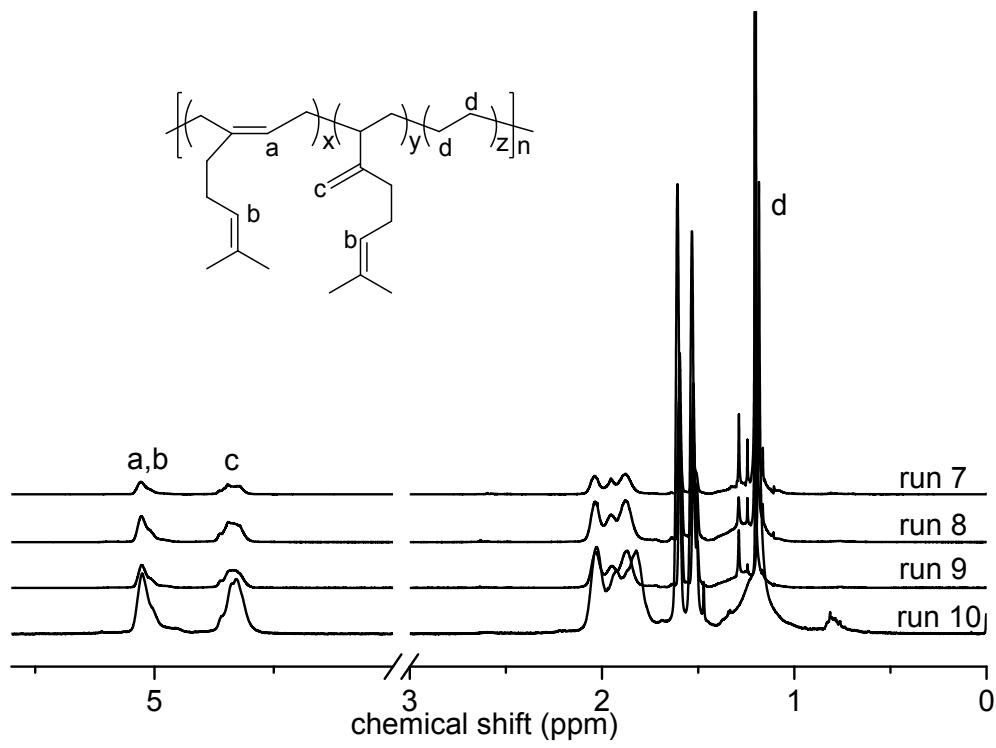


Fig. S7 ^1H -NMR spectra (400 MHz, 1,1,2,2-tetrachloroethane-*d*₂, 100 °C) of myrcene–ethylene copolymers prepared by **2**/[Ph₃C][B(C₆F₅)₄]₃ (Table 1, runs 7–10).

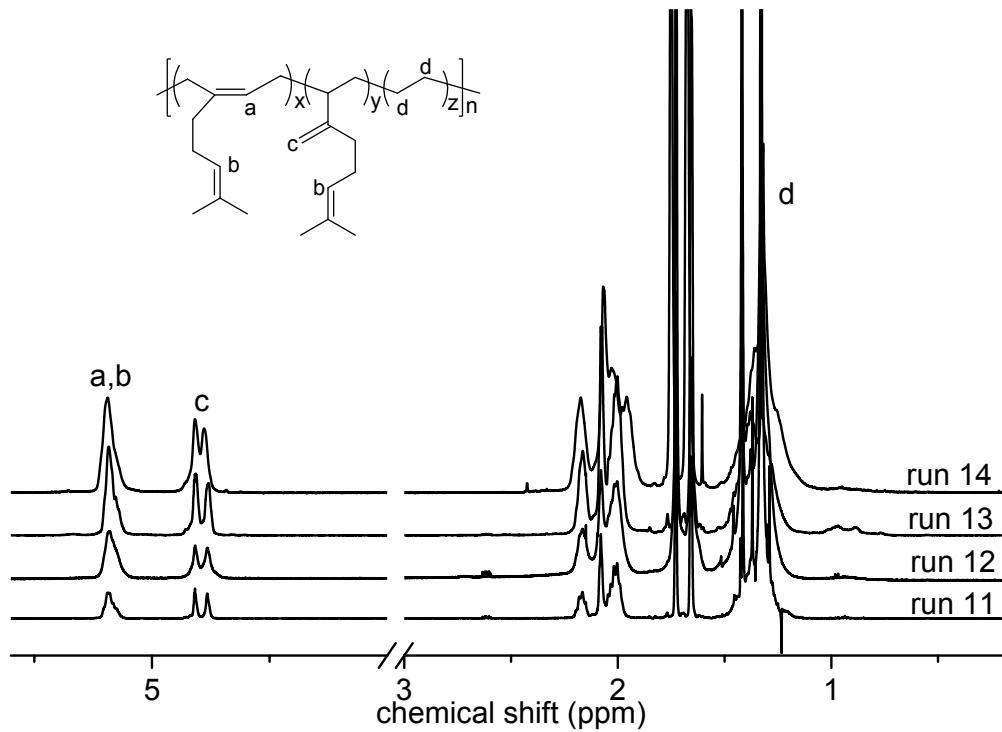


Fig. S8 ^1H -NMR spectra (400 MHz, 1,1,2,2-tetrachloroethane-*d*₂, 100 °C) of myrcene–ethylene copolymers prepared by **3**/[Ph₃C][B(C₆F₅)₄]₃ (Table 1, runs 11–14).

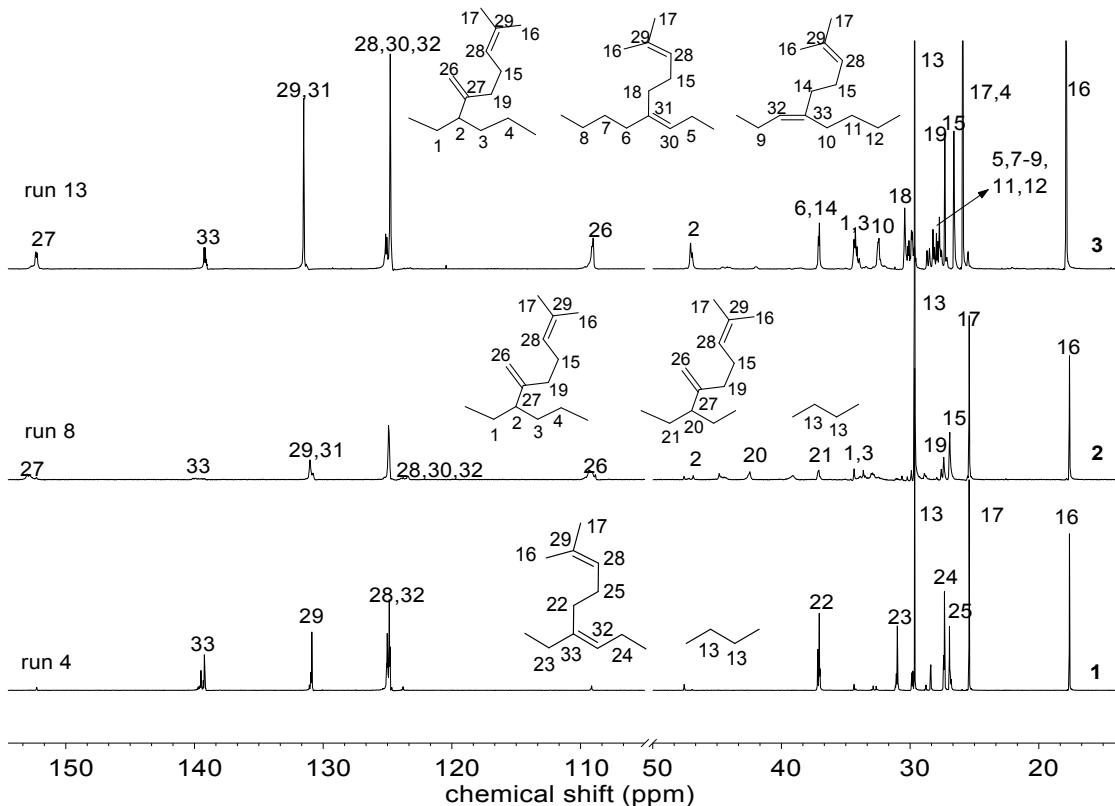


Fig. S9 ^{13}C -NMR spectra (100 MHz, 1,1,2,2-tetrachloroethane- d_2 , 100 °C) of myrcene–ethylene copolymers prepared by **1–3**/[Ph₃C][B(C₆F₅)₄]₃ (Table 1, runs 4, 8, 13).

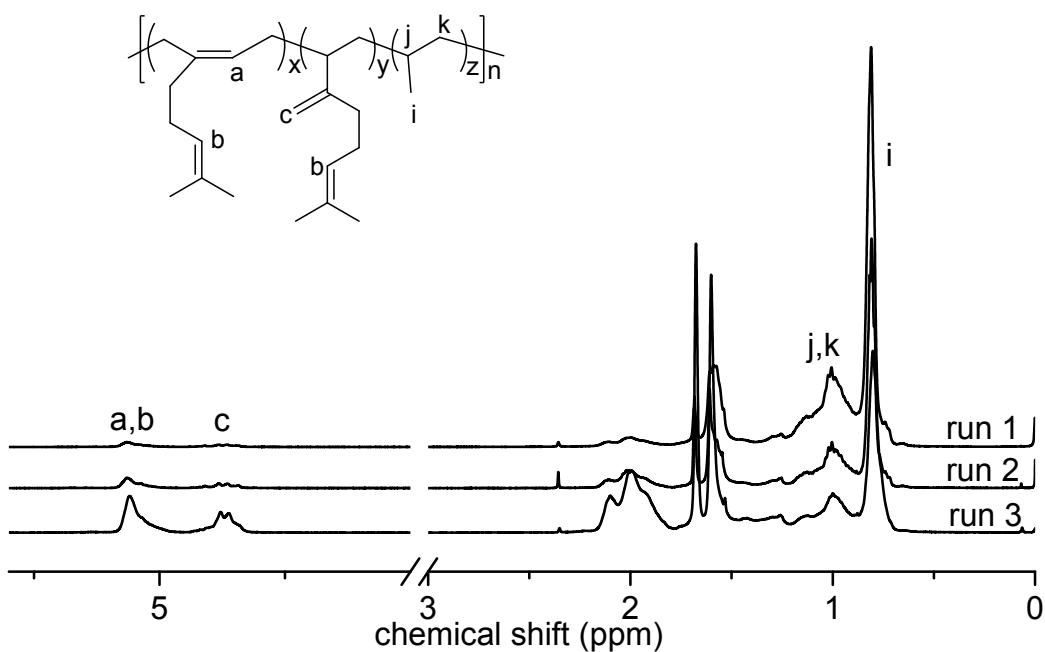


Fig. S10 ^1H -NMR spectra (400 MHz, CDCl₃, 25 °C) of myrcene–propylene copolymers prepared by **3**/[Ph₃C][B(C₆F₅)₄]₃ (Table 2, runs 1–3).

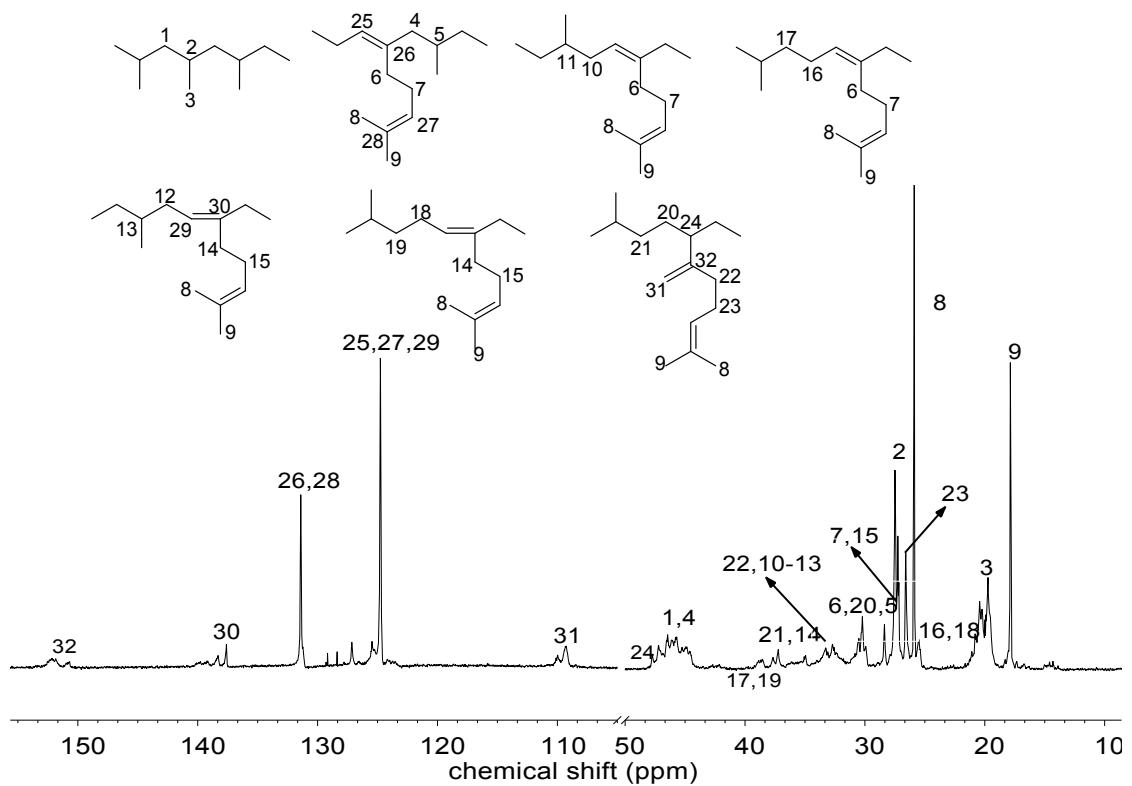


Fig. S11 ^{13}C -NMR spectrum (100 MHz, CDCl_3 , 25 °C) of a myrcene–propylene copolymer prepared by **3**/[$\text{Ph}_3\text{C}][\text{B}(\text{C}_6\text{F}_5)_4]$ ₃ (Table 2, run 3).

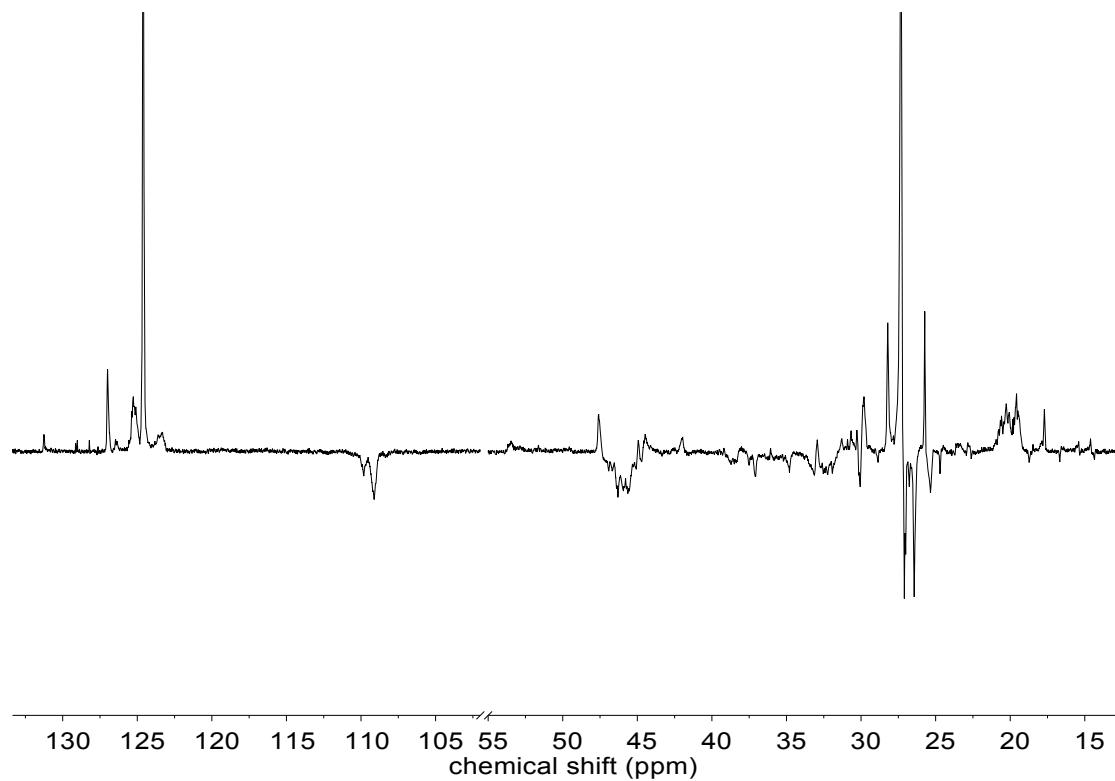


Fig. S12 DEPT135- ^{13}C NMR spectrum of a myrcene–propylene copolymer prepared by **3**/[$\text{Ph}_3\text{C}][\text{B}(\text{C}_6\text{F}_5)_4]$ ₃ (Table 2, run 3).

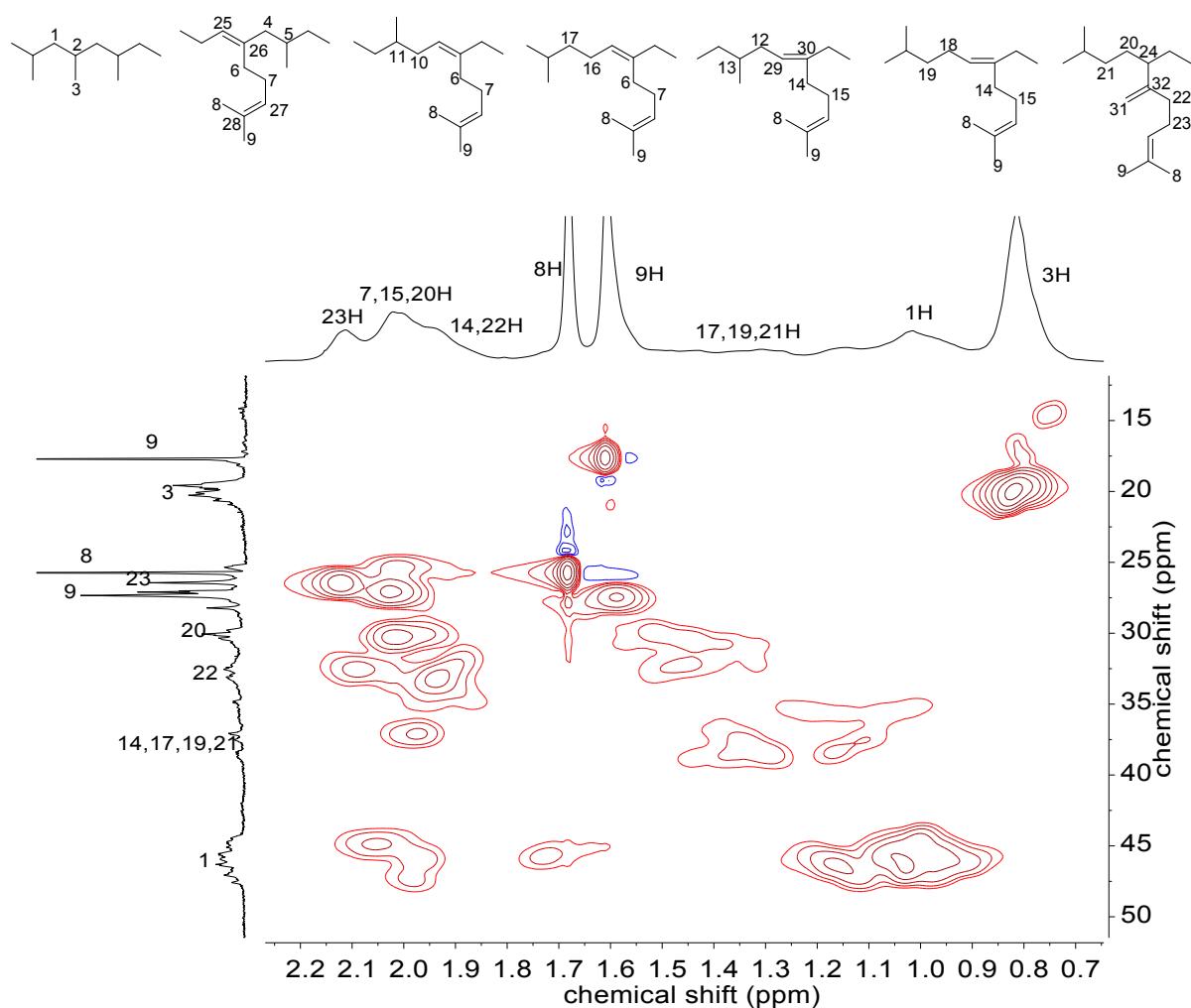


Fig. S13 Aliphatic part of the HMBC NMR spectrum (125 MHz, CDCl₃, 25°C) of a myrcene–propylene copolymer prepared by **3**/[Ph₃C][B(C₆F₅)₄]₃ (Table 2, run 3).

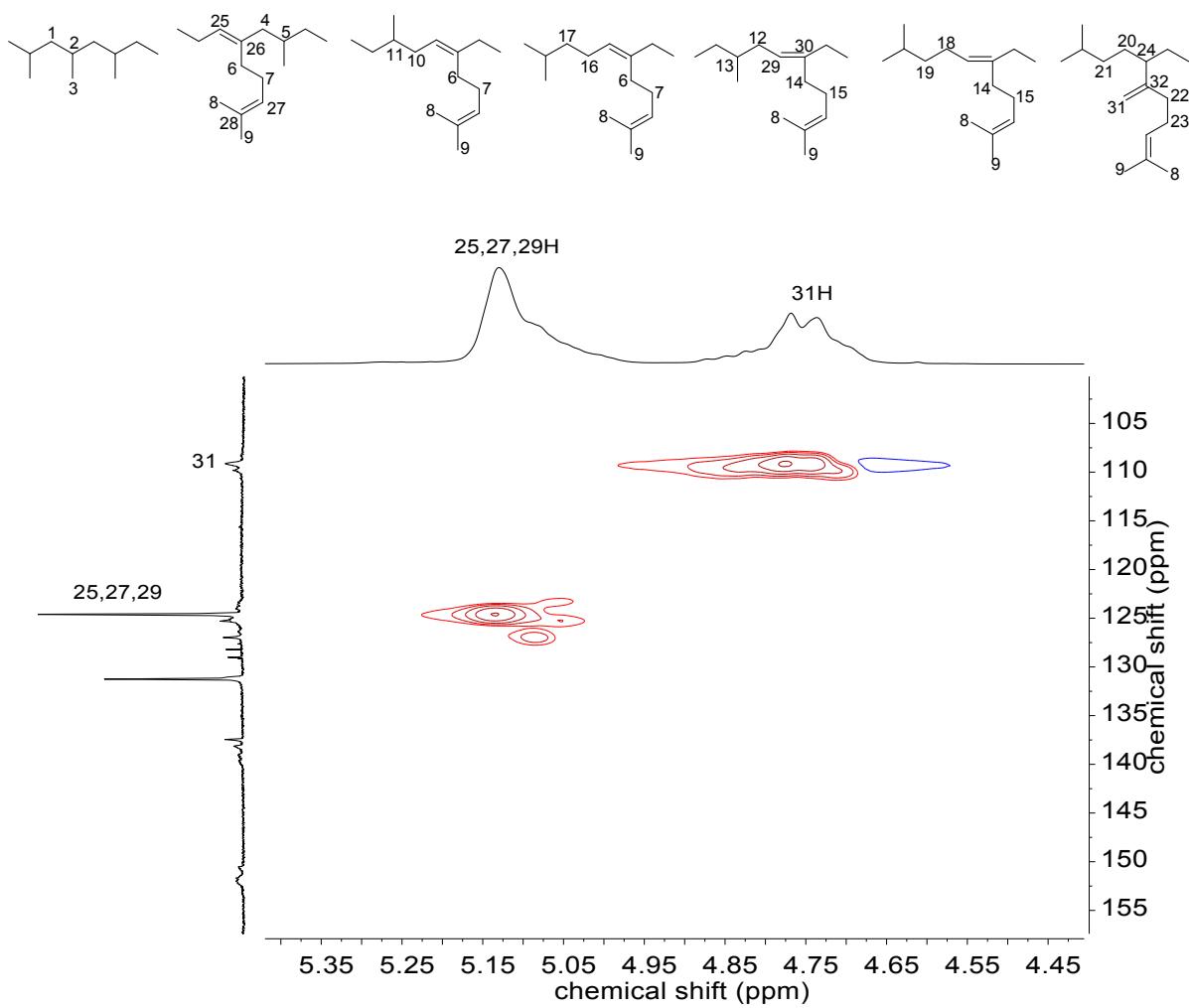
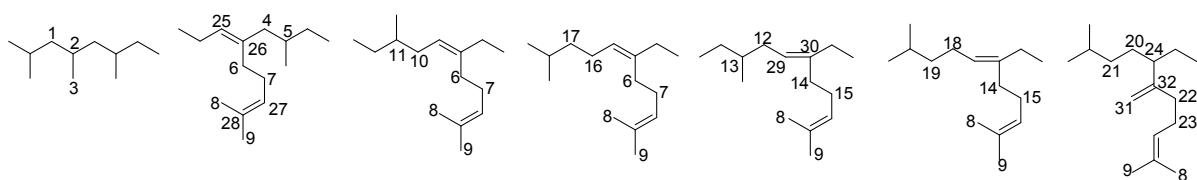


Fig. S14 Olefinic part of the HMBC NMR spectrum (125 MHz, CDCl₃, 25°C) of a myrcene–propylene copolymer prepared by **3**/[Ph₃C][B(C₆F₅)₄]₃ (Table 2, run 3).



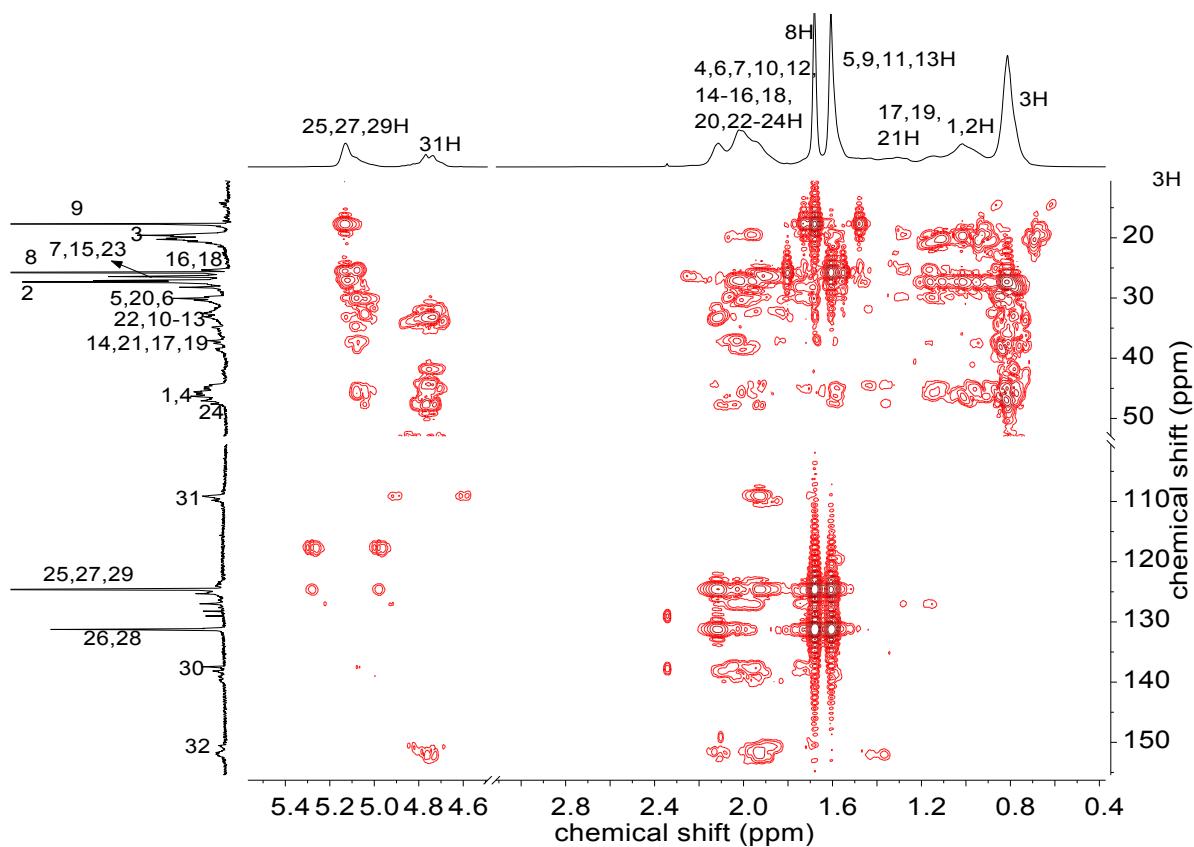


Fig. S15 The HSQC NMR spectrum of a myrcene–propylene copolymer prepared by **3**/[Ph₃C][B(C₆F₅)₄]₃ (Table 2, run 3).

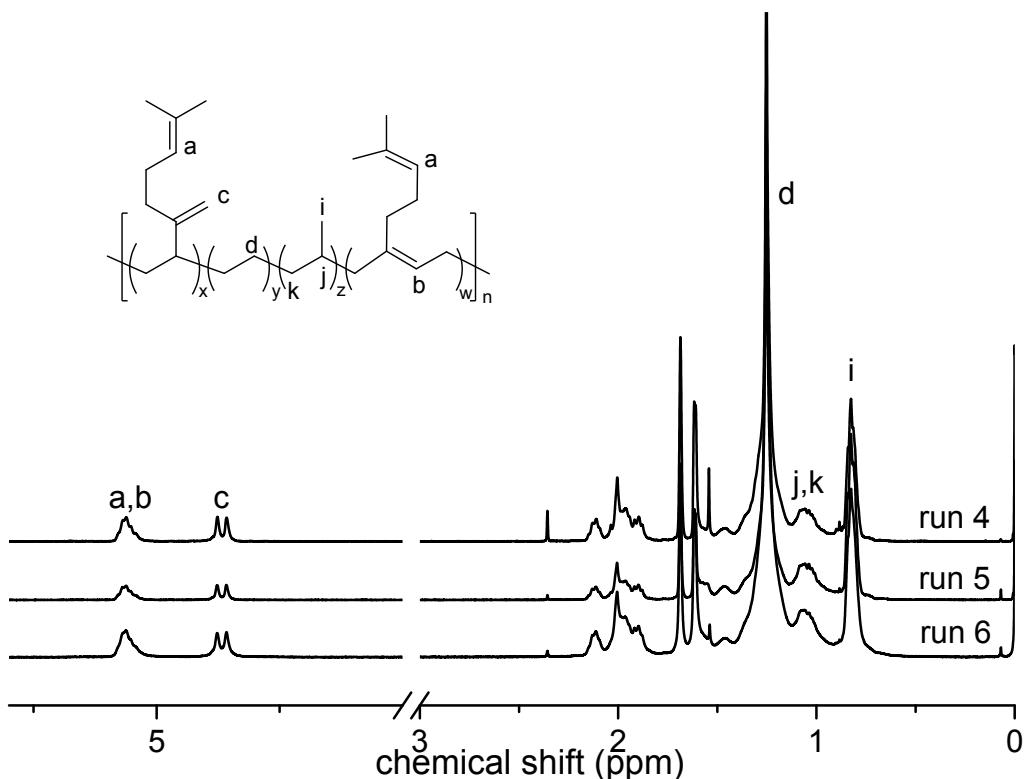


Fig. S16 ¹H-NMR spectra (400 MHz, CDCl₃, 25 °C) of myrcene–propylene–ethylene terpolymers prepared by **3**/[Ph₃C][B(C₆F₅)₄]₃ (Table 2, runs 4–6).

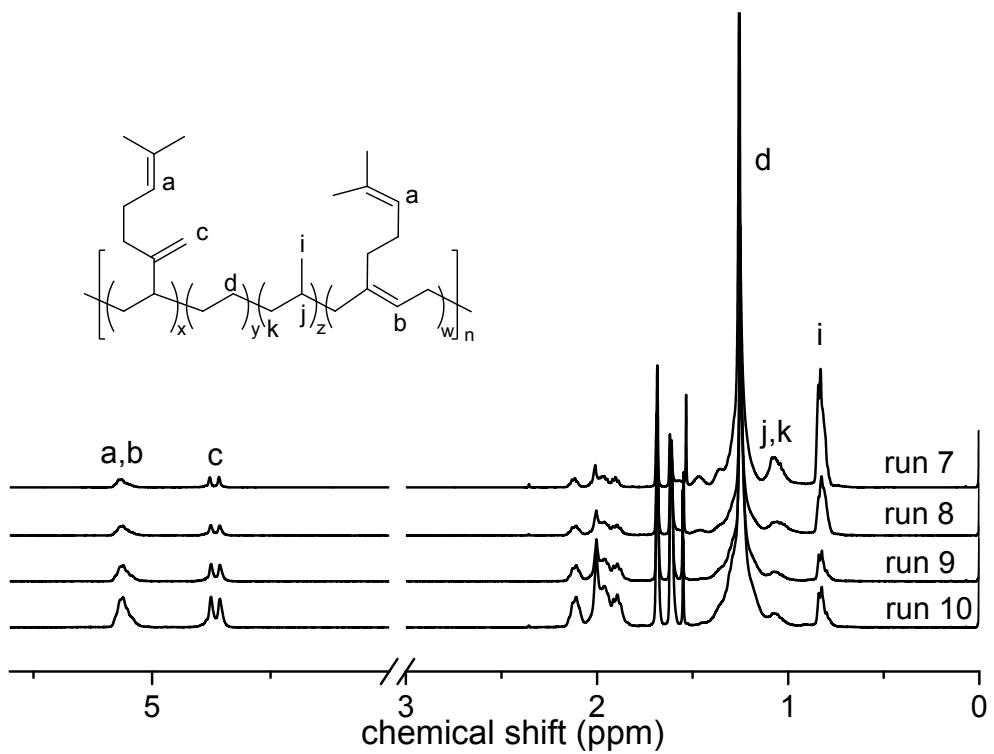


Fig. S17 ¹H-NMR spectra (400 MHz, CDCl₃, 25 °C) of myrcene–propylene–ethylene terpolymers prepared by **3**/[Ph₃C][B(C₆F₅)₄]₃ (Table 2, runs 7–10).

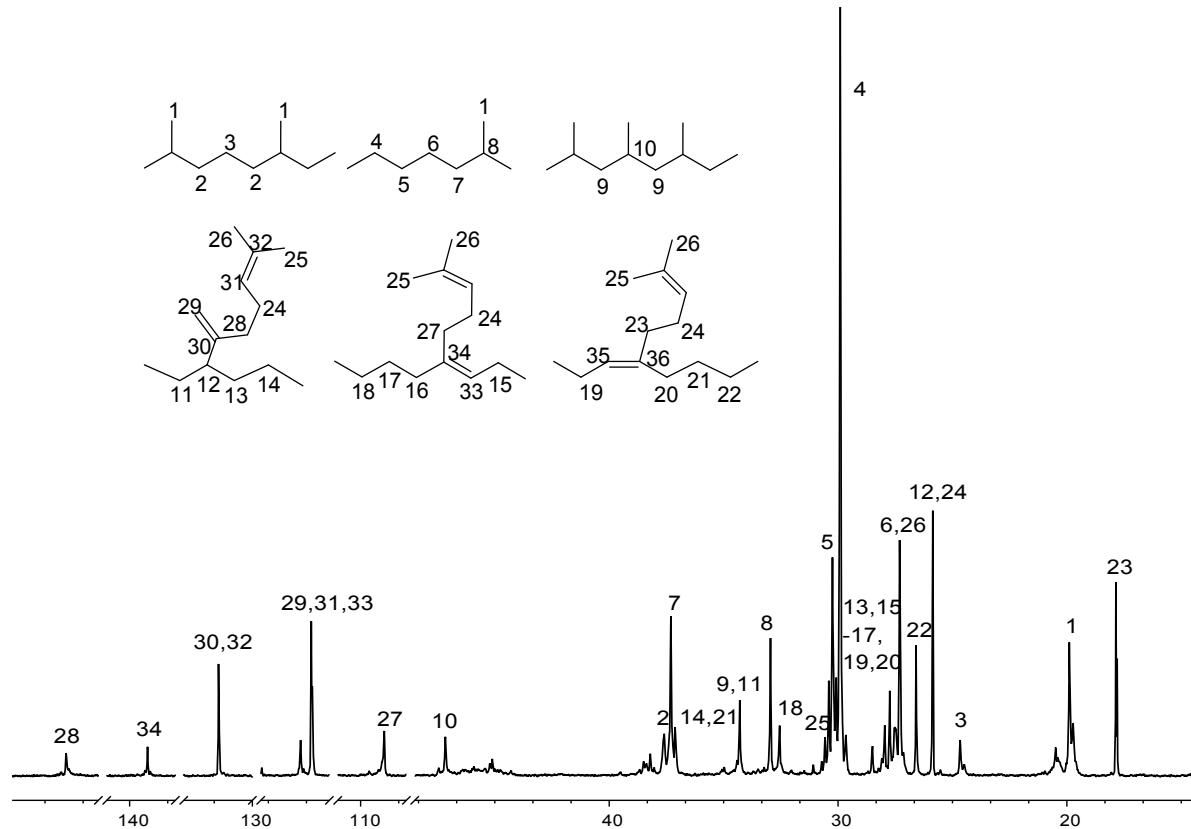


Fig. S18 ¹³C-NMR spectrum (100 MHz, CDCl₃, 25 °C) of an myrcene–propylene–ethylene terpolymer prepared by **3**/[Ph₃C][B(C₆F₅)₄]₃ (Table 2, run 6).

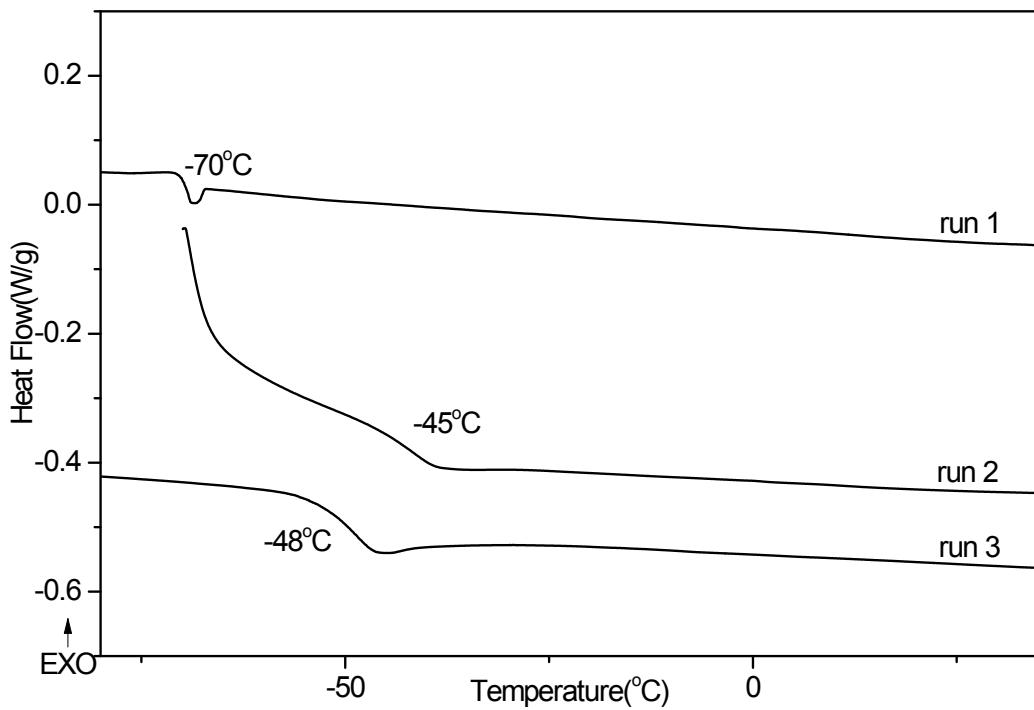


Fig. S19 DSC curves of myrcene homopolymers prepared by **1–3/[Ph₃C][B(C₆F₅)₄]₃** (Table 1, runs 1–3).

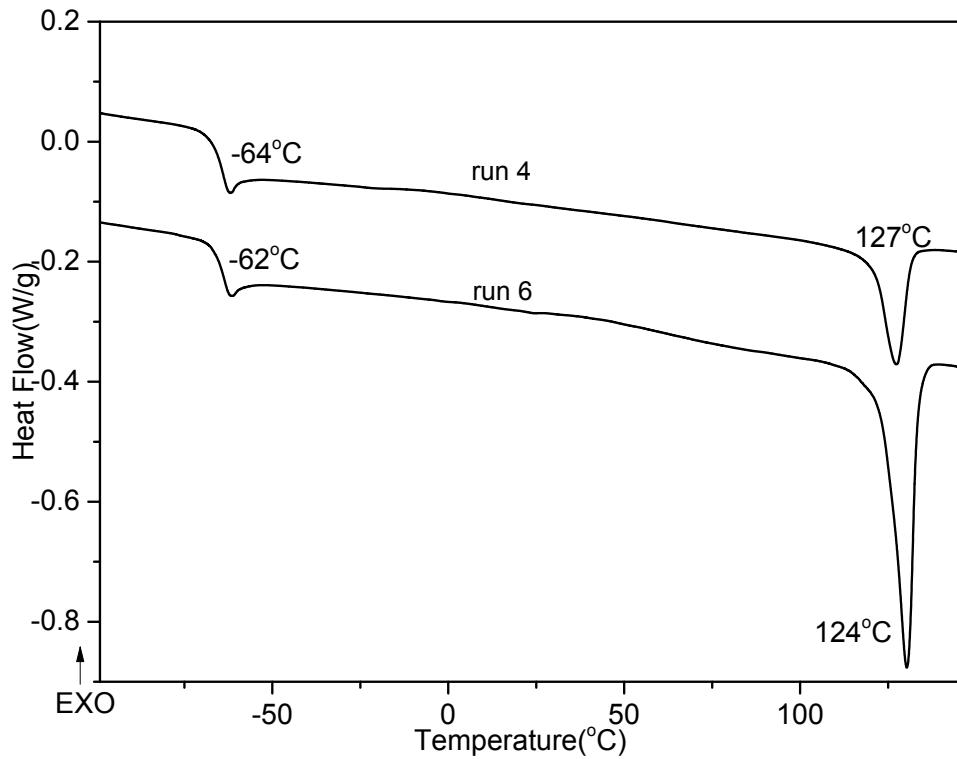


Fig. S20 DSC curves of myrcene–ethylene copolymers prepared by **1/[Ph₃C][B(C₆F₅)₄]₃** (Table 1, runs 4 and 6).

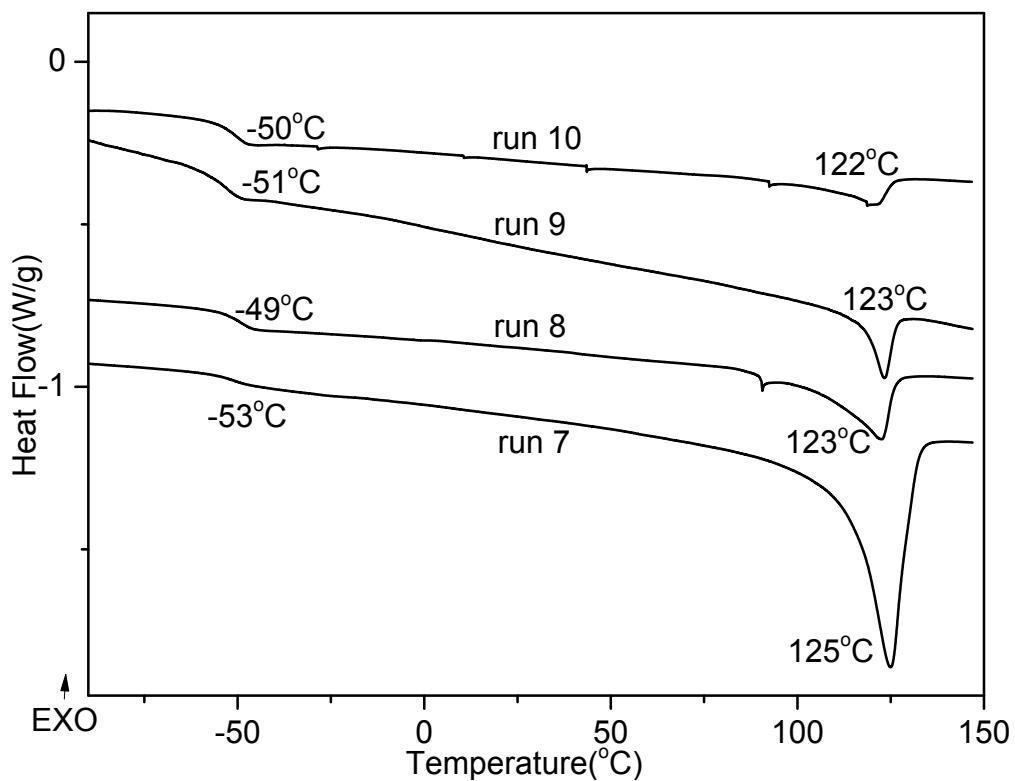


Fig. S21 DSC curves of myrcene–ethylene copolymers prepared by **2**/[Ph₃C][B(C₆F₅)₄]₃ (Table 1, runs 7–10).

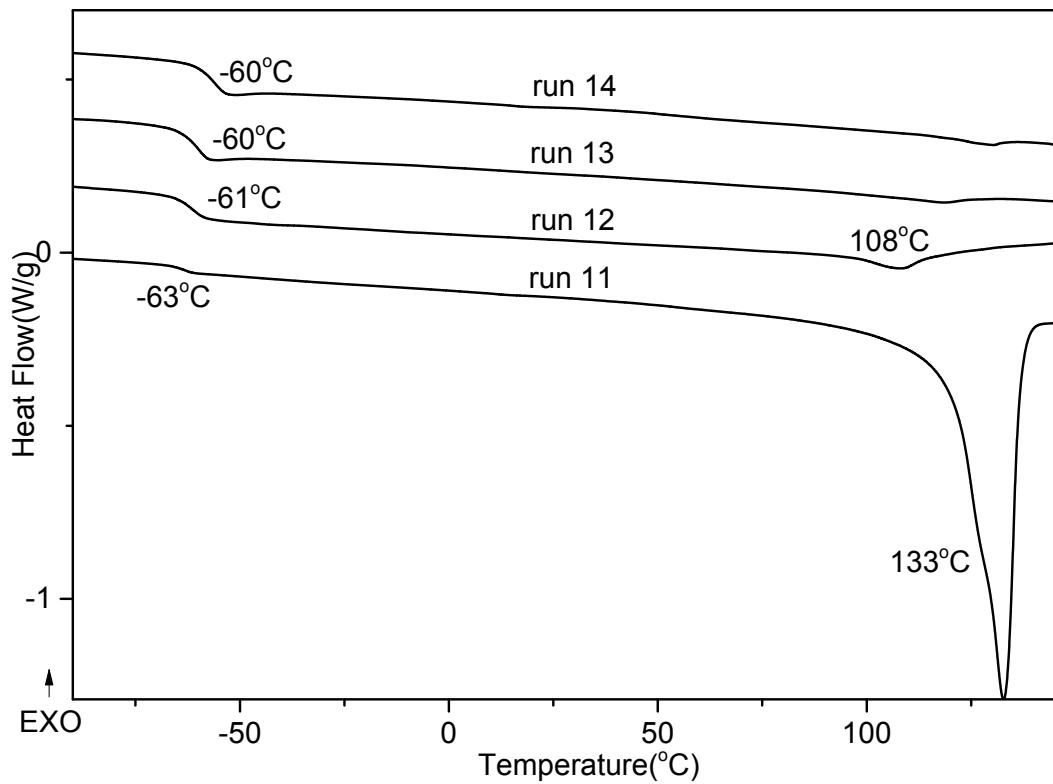


Fig. S22 DSC curves of myrcene–ethylene copolymers prepared by **3**/[Ph₃C][B(C₆F₅)₄]₃ (Table 1, runs 11–14).

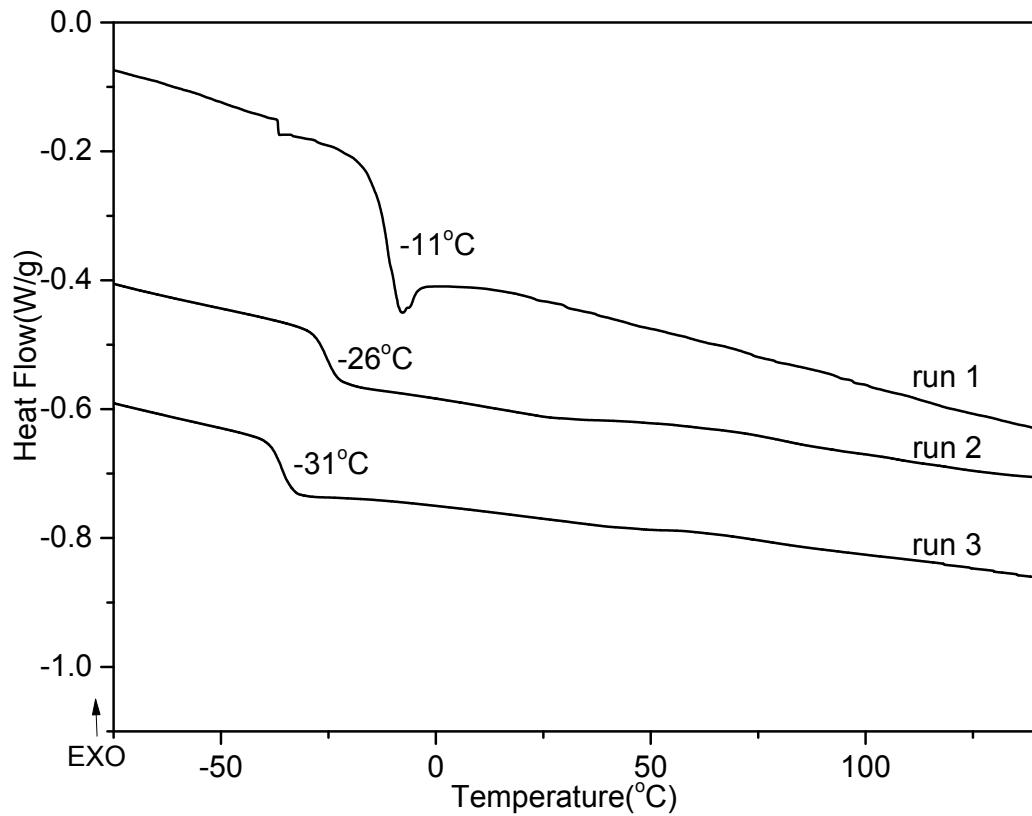


Fig. S23 DSC curves of myrcene–propylene copolymers prepared by **3**/[Ph₃C][B(C₆F₅)₄]₃ (Table 2, runs 1–3).

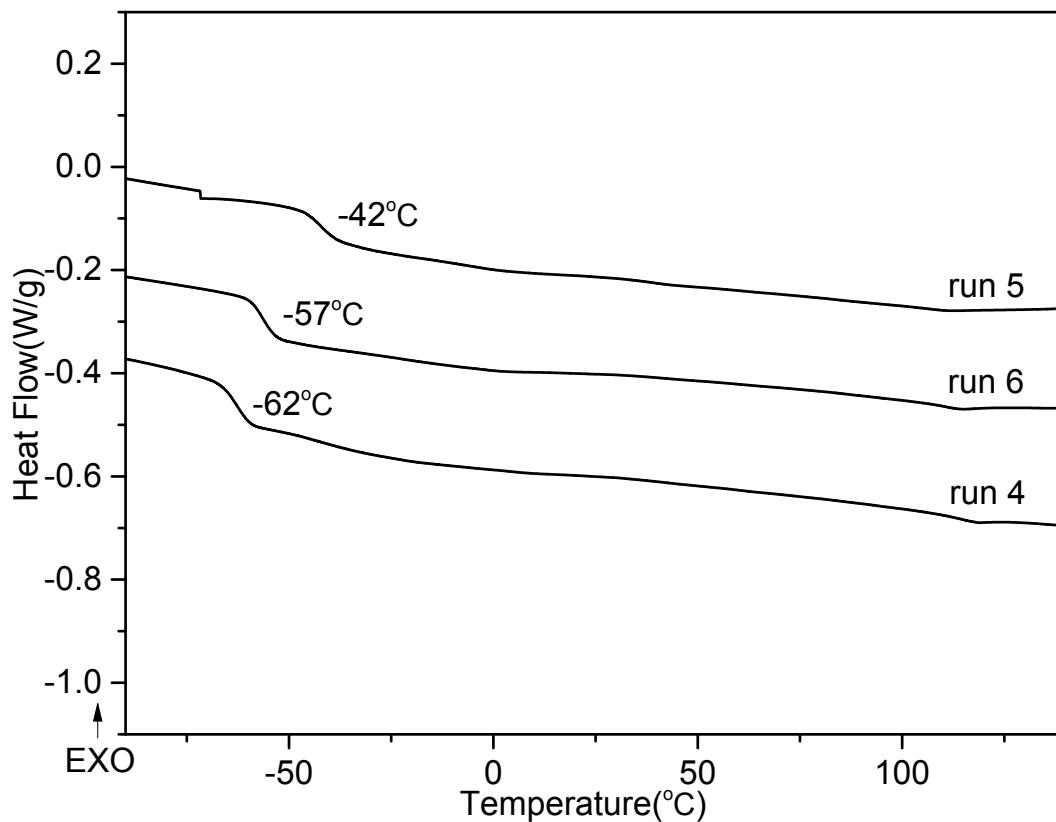


Fig. S24 DSC curves of myrcene–propylene–ethylene terpolymers prepared by **3**/[Ph₃C][B(C₆F₅)₄]₃ (Table 2, runs 4–6).

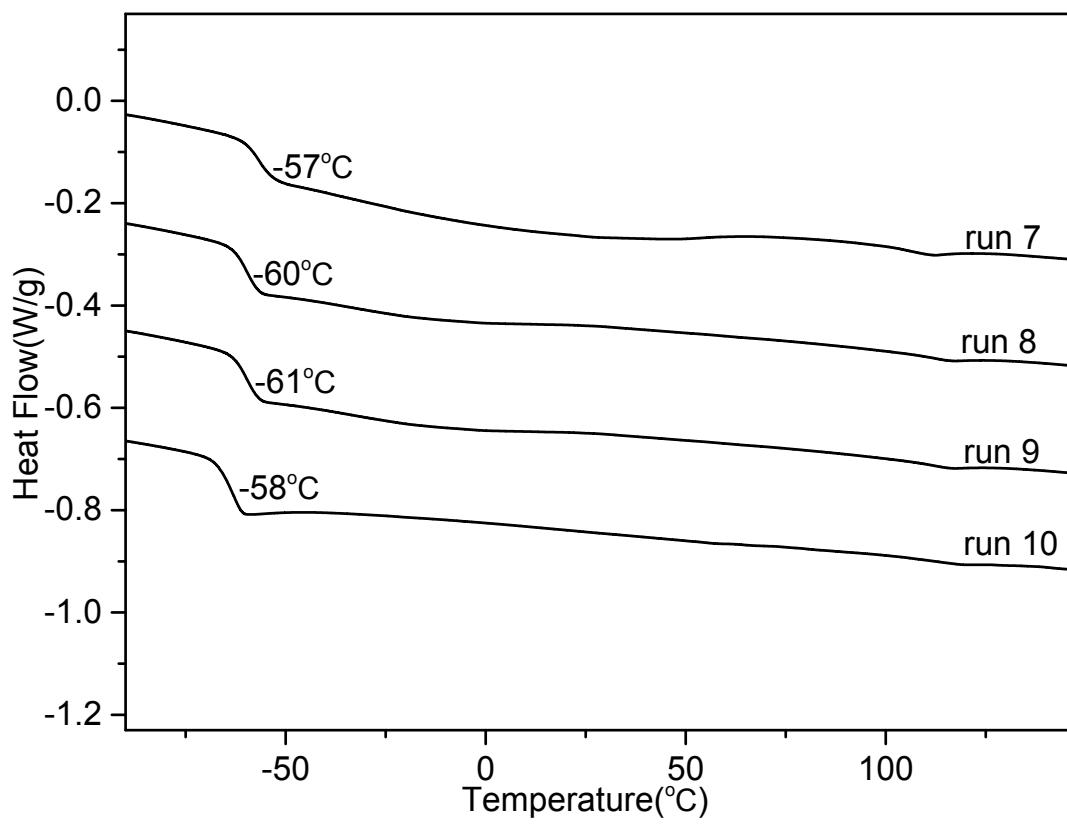


Fig. S25 DSC curves of myrcene–propylene–ethylene terpolymers prepared by **3**/[Ph₃C][B(C₆F₅)₄]₃ (Table 2, runs 7–10).

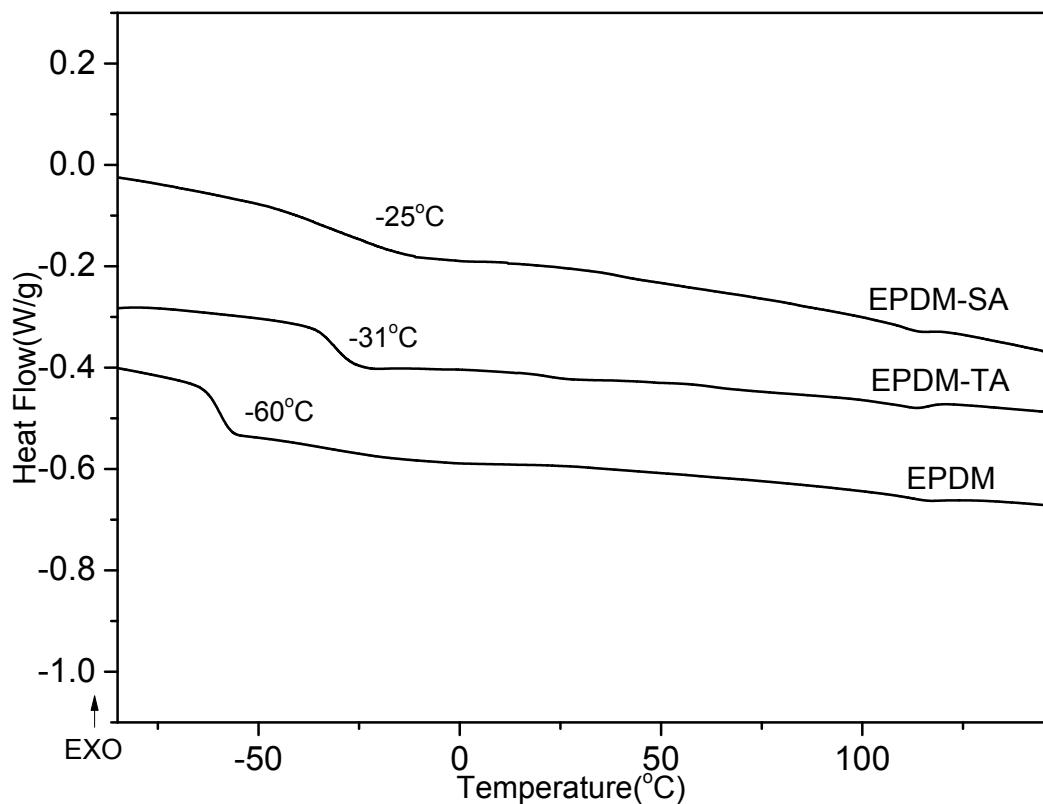


Fig. S26 DSC curves of EPDM, EPDM-TA, EPDM-SA.

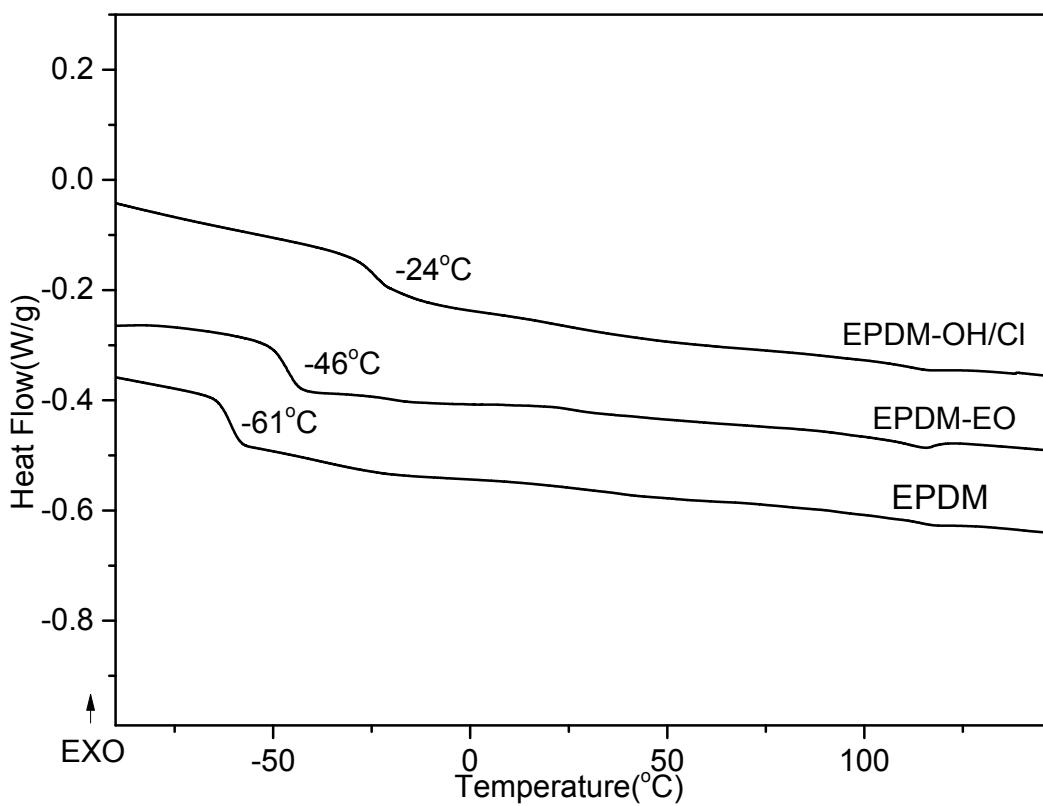


Fig. S27 DSC curves of EPDM, EPDM-EO, EPDM-OH/Cl.

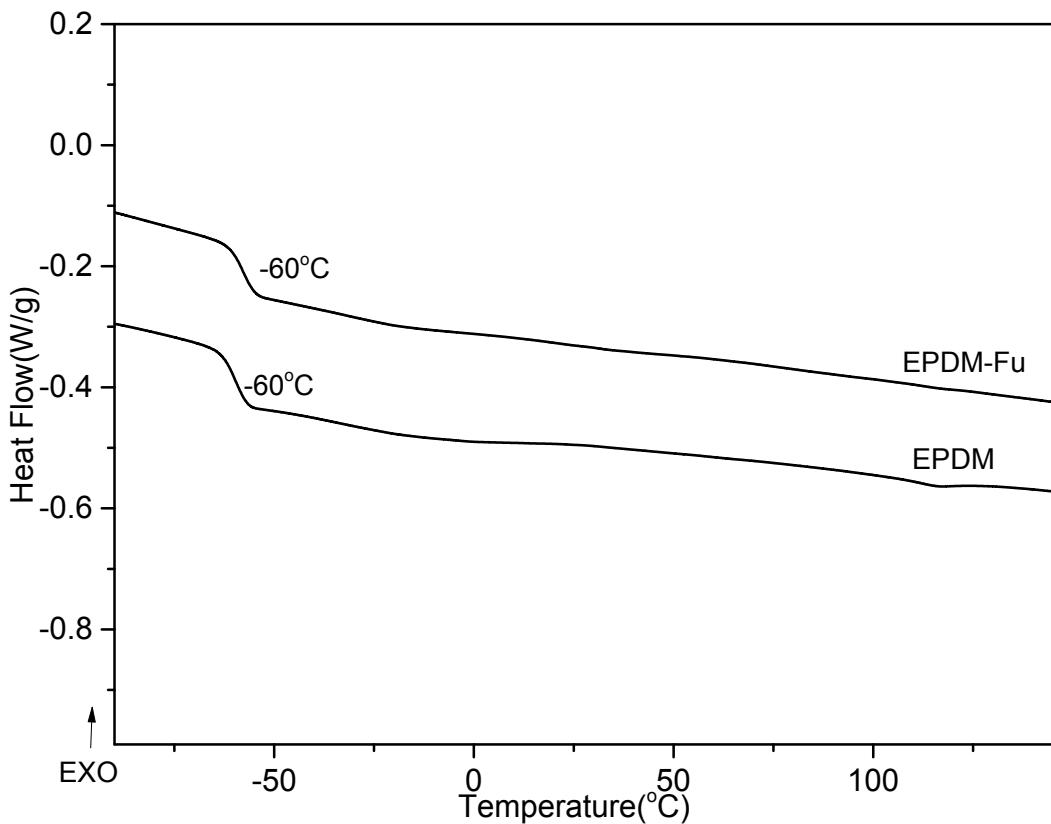


Fig. S28 DSC curves of EPDM and EPDM-Fu.

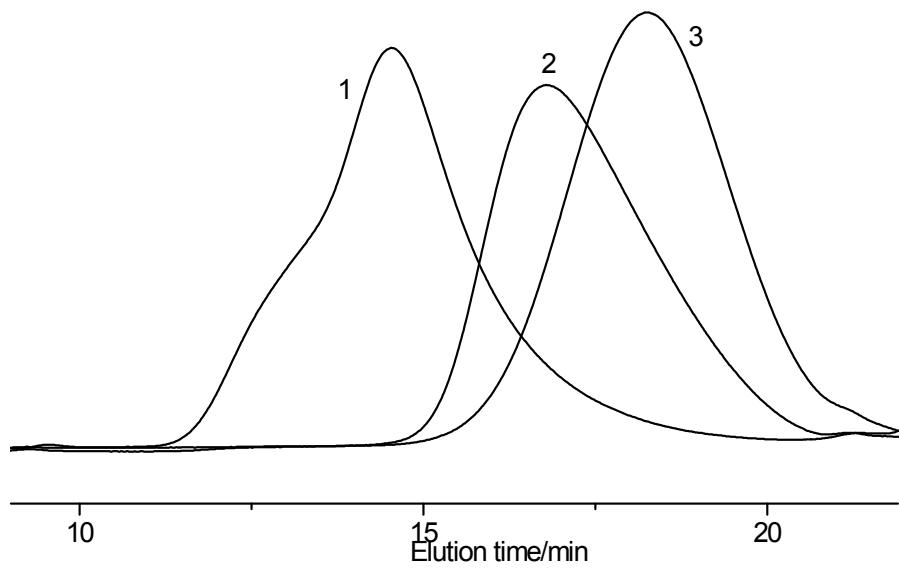


Fig. S29 GPC curves of myrcene homopolymers prepared by **1–3**/[Ph₃C][B(C₆F₅)₄]₃ (Table 1, runs 1–3).

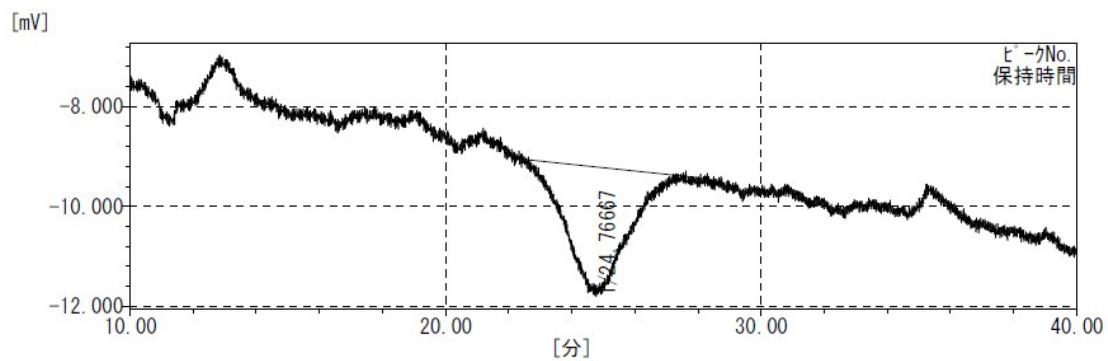


Fig. S30 GPC curve of a myrcene–ethylene copolymer prepared by **1**/[Ph₃C][B(C₆F₅)₄]₃ (Table 1, run 6).

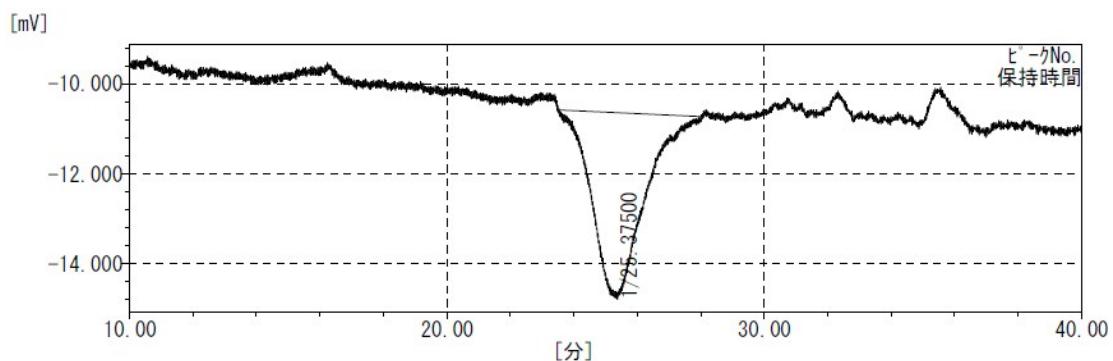


Fig. S31 GPC curve of a myrcene–ethylene copolymer prepared by **2**/[Ph₃C][B(C₆F₅)₄]₃ (Table 1, run 9).

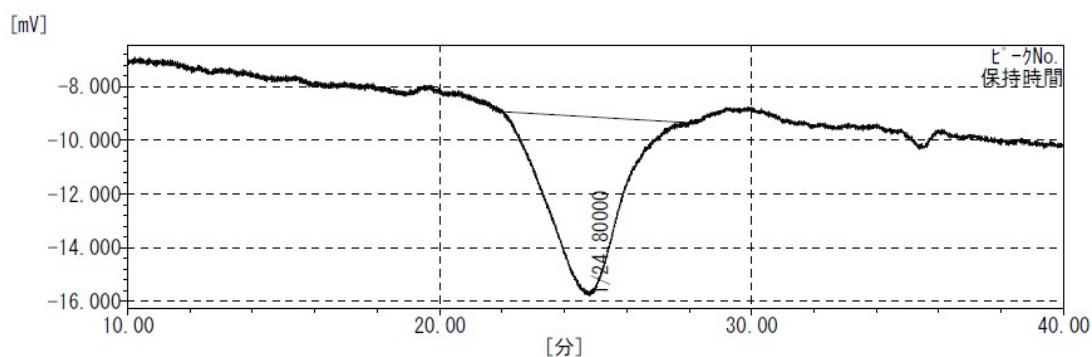


Fig. S32 GPC curve of a myrcene–ethylene copolymer prepared by **3**/[Ph₃C][B(C₆F₅)₄]₃ (Table 1, run 13).

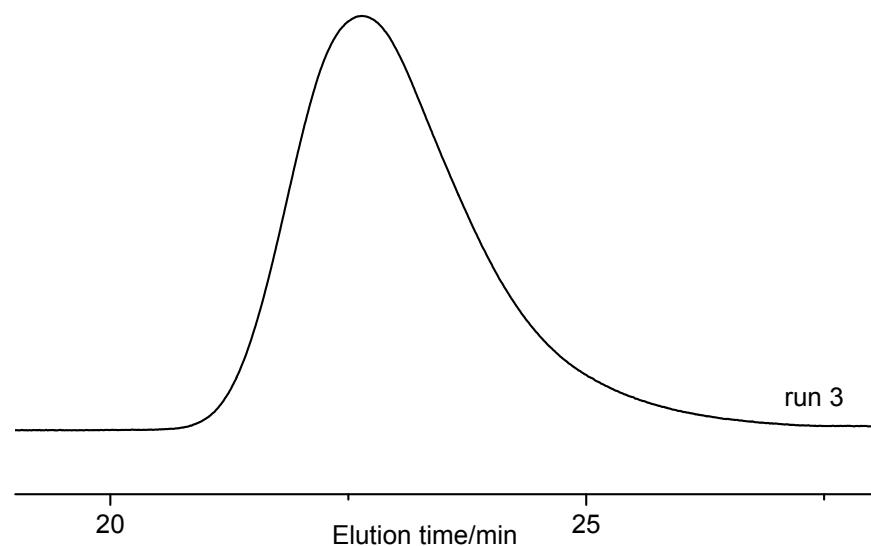


Fig. S33 GPC curve of a myrcene–propylene copolymer prepared by **3**/[Ph₃C][B(C₆F₅)₄]₃ (Table 2, run 3).

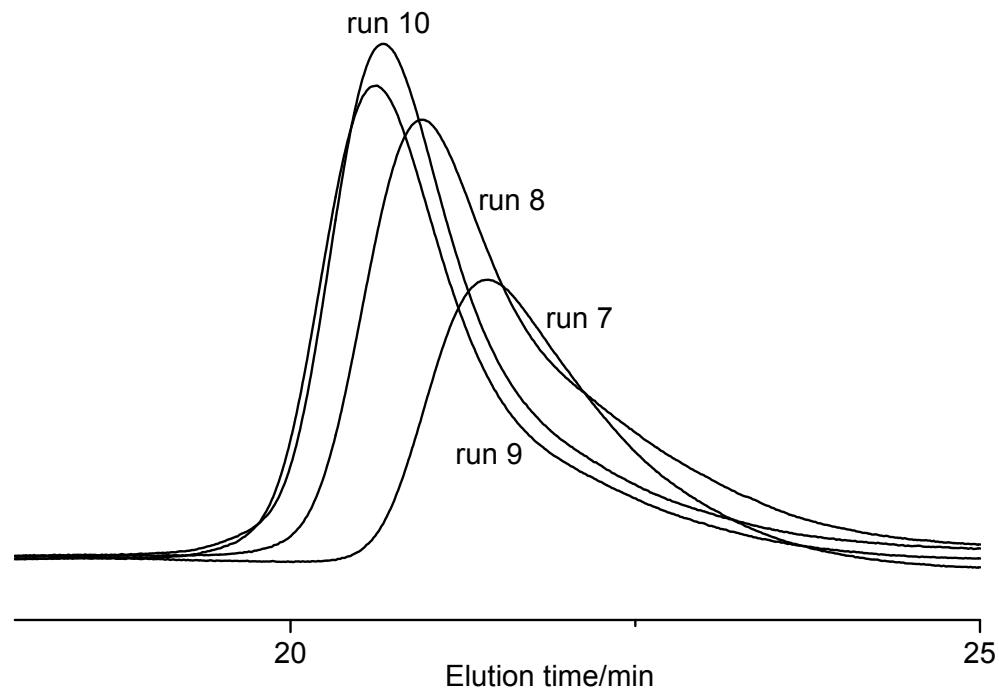


Fig. S34 GPC curves of myrcene–propylene–ethylene terpolymers prepared by **3**/[Ph₃C][B(C₆F₅)₄]₃ (Table 2, runs 7–10).