Electronic Supplementary Information

Stereoselective copolymerization of (N,N-diphenylamino)styrene and isoprene by a C₅H₅-ligated scandium catalyst: synthesis of amino-functionalized crystalline styrenic thermoplastic elastomers

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Fig. S1 $^1$H-NMR spectrum of a DMAS polymer prepared by ($C_5H_5$)$_2$Sc(CH$_2$C$_6$H$_4$NMe$_2$-o)$_2$/[Ph$_3$C][B(C$_6$F$_5$)$_4$] in chloroform-d at room temperature.

Fig. S2 $^1$H-NMR spectrum of a DEAS polymer prepared by ($C_5H_5$)$_2$Sc(CH$_2$C$_6$H$_4$NMe$_2$-o)$_2$/[Ph$_3$C][B(C$_6$F$_5$)$_4$] in chloroform-d at room temperature.
Fig. S3: 1H-NMR spectra of a DPAS polymer prepared by (C₅H₅)Sc(CH₂C₆H₄NMe₂-o)₂/[Ph₃C][B(C₆F₅)₄] or [Ph₃C][B(C₆F₅)₄] in chloroform-d at room temperature.

Fig. S4: 1H-NMR spectra of DPAS-IP copolymers with different composition prepared by (C₅H₅)Sc(CH₂C₆H₄NMe₂-o)₂/[Ph₃C][B(C₆F₅)₄] in 1,1,2,2-tetrachloroethane-d₂ at 110 °C.
Fig. S5  $^1$H-NMR spectra of DPAS-IP-DPAS terpolymers with different composition prepared by (C$_5$H$_5$)Sc(CH$_2$C$_6$H$_4$NMe$_2$-o)$_2$/[Ph$_3$C][B(C$_6$F$_5$)$_4$] in 1,1,2,2-tetrachloroethane-d$_2$ at 110 °C.

Fig. S6  $^{13}$C-NMR spectrum of a DPAS-IP-DPAS terpolymer prepared by (C$_5$H$_5$)Sc(CH$_2$C$_6$H$_4$NMe$_2$-o)$_2$/[Ph$_3$C][B(C$_6$F$_5$)$_4$] in 1,1,2,2-tetrachloroethane-d$_2$ at 110 °C.
Fig. S7 Plots of the conversions of DPAS (black) and IP (red) versus the polymerization time.

Fig. S8 Plots of $M_n$ and $M_w/M_n$ as a function of the DPAS/catalyst ratio for DPAS-IP copolymerization.

Fig. S9 Plots of $M_n$ and $M_w/M_n$ as a function of the [DPAS+IP]/catalyst ratio for DPAS-IP copolymerization.