Supporting Information

Star Polymerization of Norbornene Derivatives Using Tri-functionalized Blechert's Olefin Metathesis Catalyst

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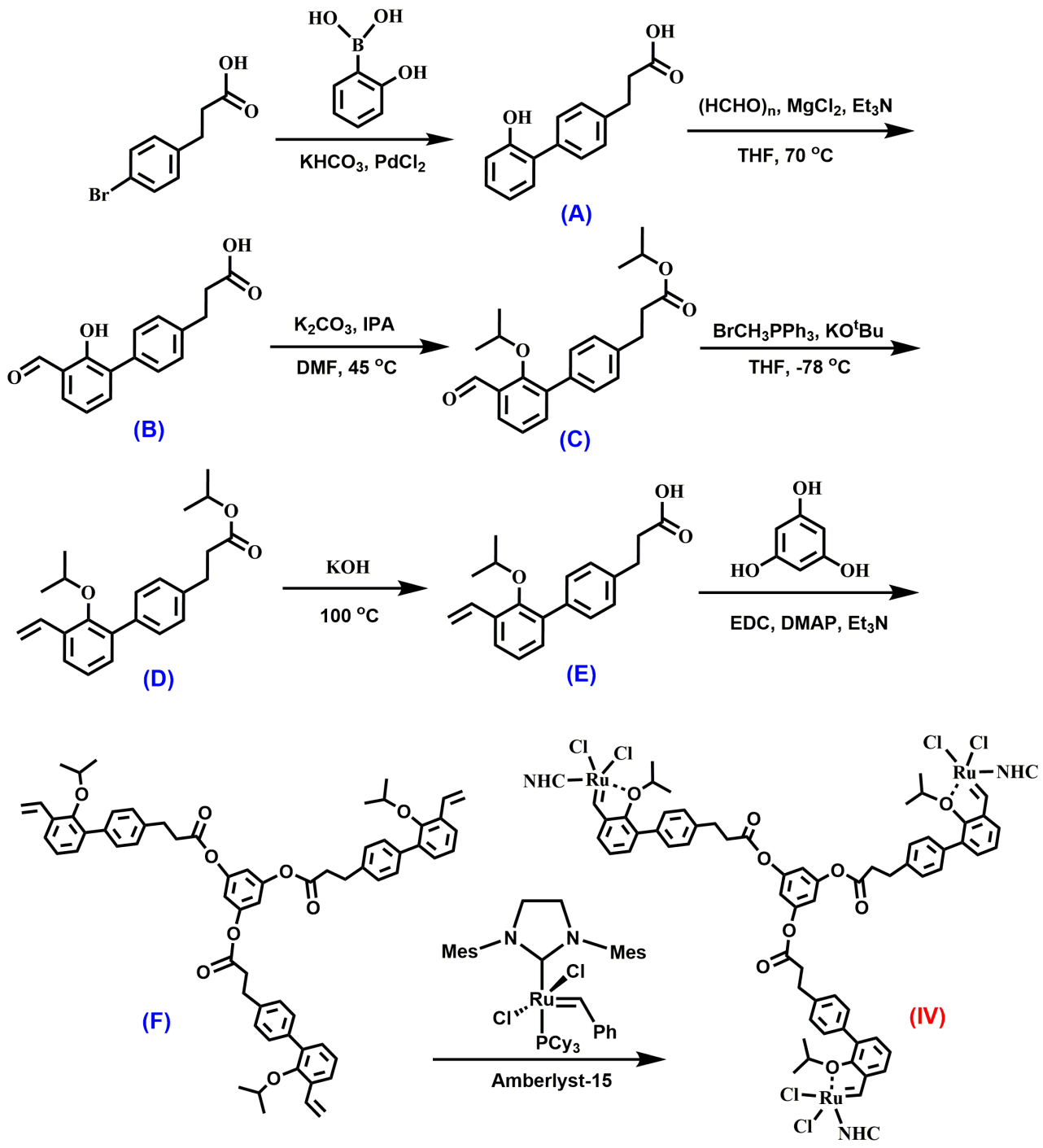

Scheme S1. The route to the synthesis of star-type trinuclear Ru catalyst (**IV**).

2. ^{1}H and $^{13}C\{^{1}H\}$ NMR spectra of complexes A-F and IV

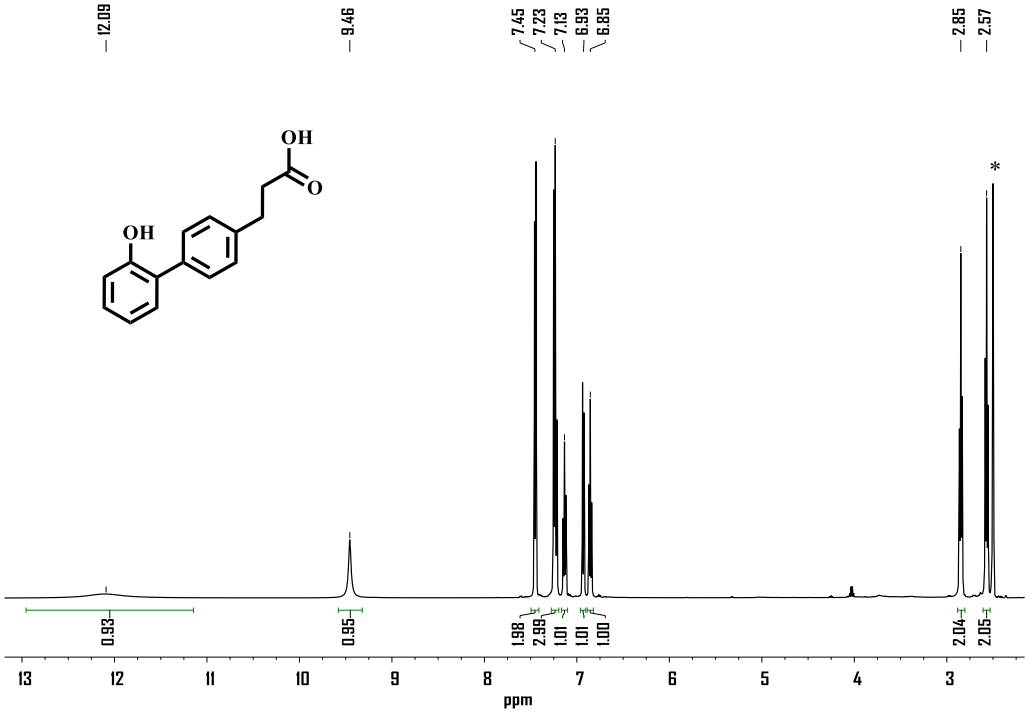

Figure S1. ^{1}H NMR spectrum (500 MHz) of complex **A** in DMSO-d_6 (*) at 25 ^{o}C.

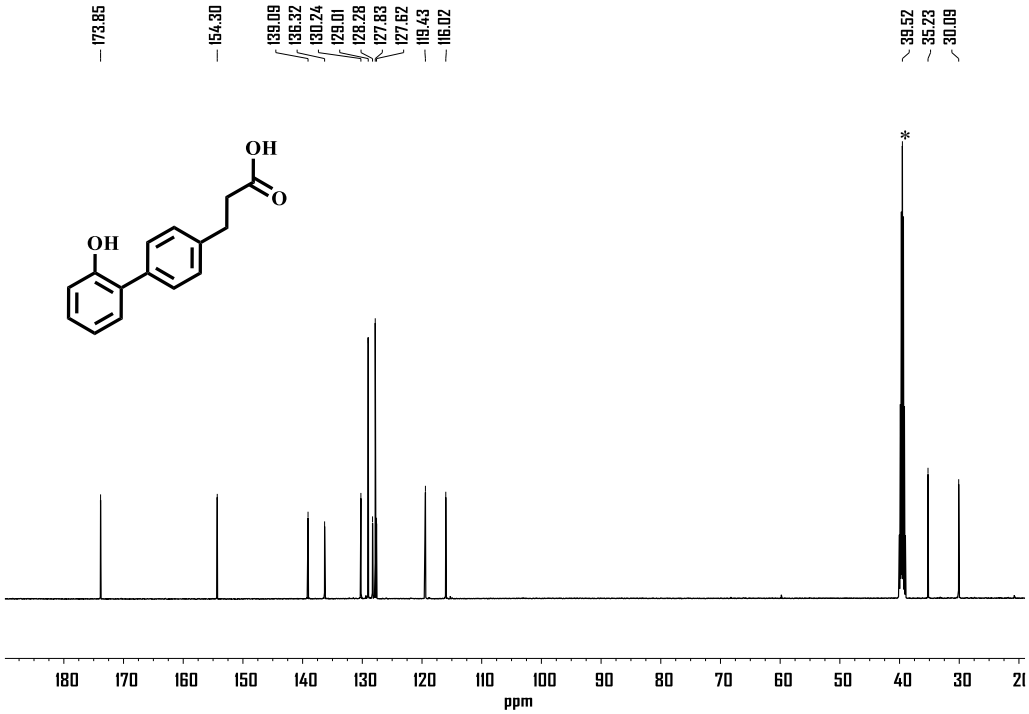

Figure S2. $^{13}C\{^{1}H\}$ NMR spectrum (125 MHz) of complex **A** in DMSO-d_6 (*) at 25 ^{o}C.

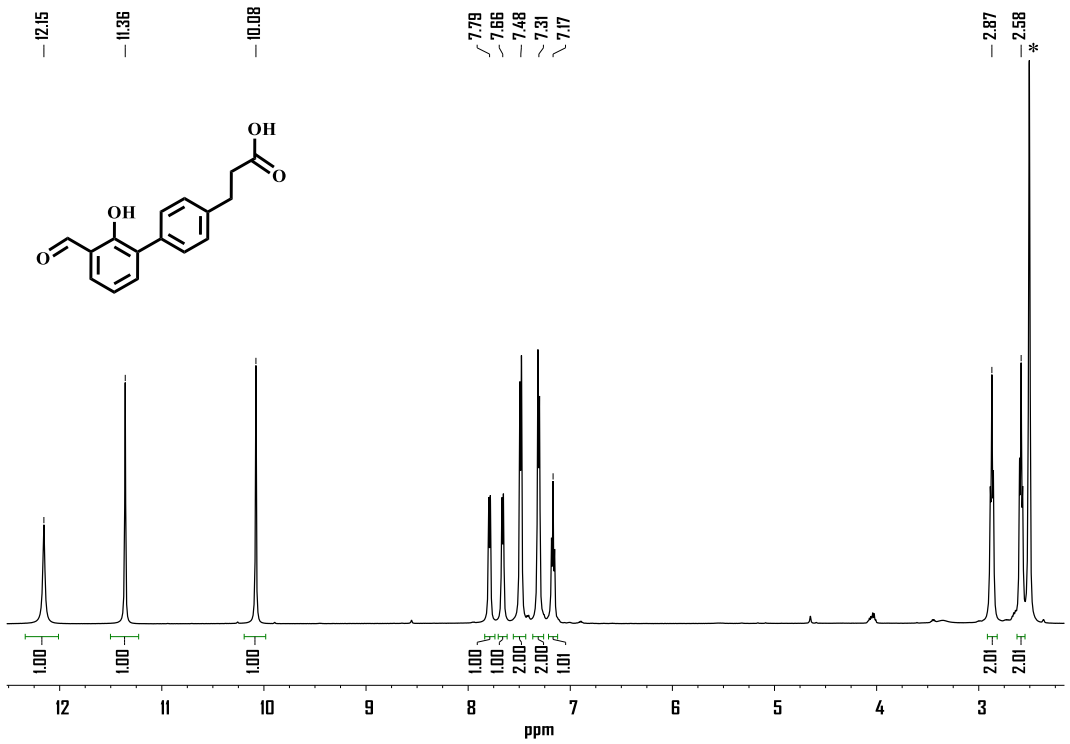

Figure S3. ^{1}H NMR spectrum (500 MHz) of complex **B** in DMSO-d_6 (*) at 25 ^{o}C.

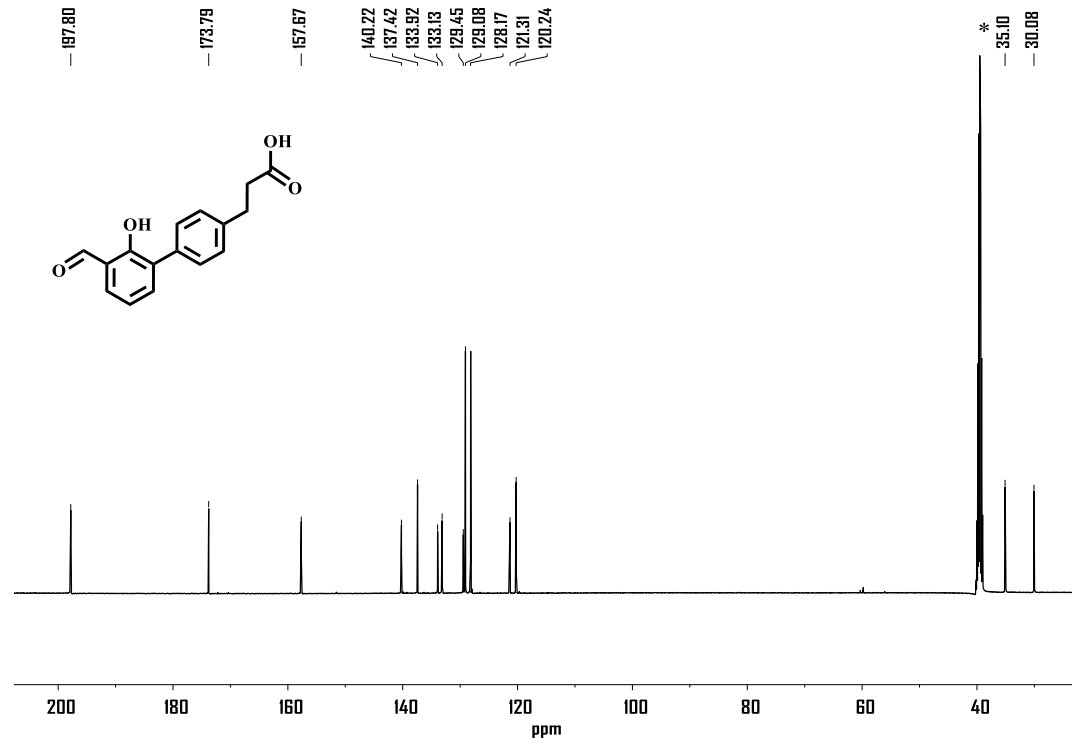

Figure S4. ^{13}C{^{1}H} NMR spectrum (125 MHz) of complex **B** in DMSO-d_6 (*) at 25 ^{o}C.

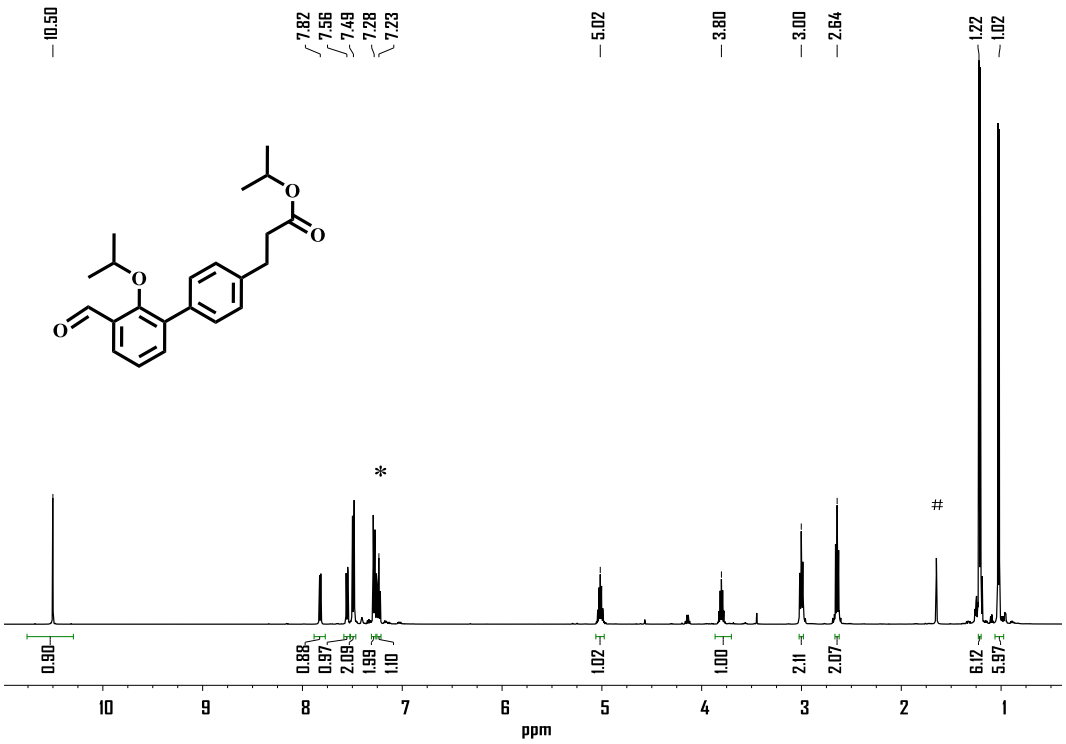

Figure S5. ^{1}H NMR spectrum (500 MHz) of complex **C** in $CDCl_3$ (*) at 25 ^{o}C. (#H_2O)

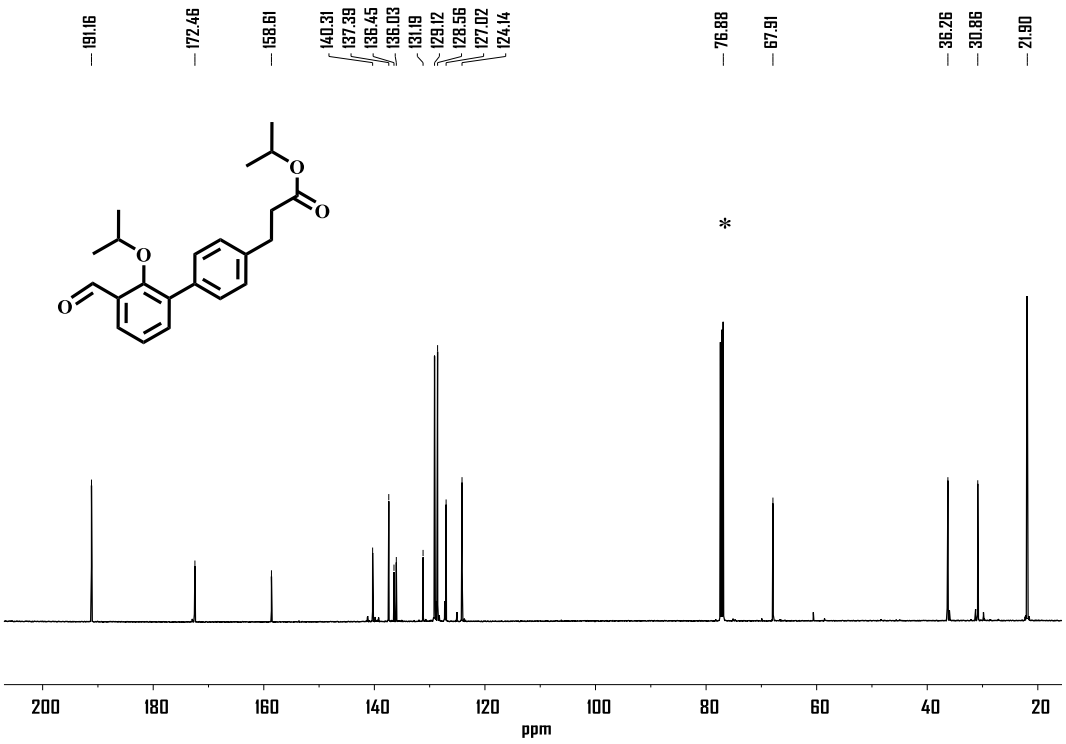

Figure S6. $^{13}C\{^{1}H\}$ NMR spectrum (125 MHz) of complex **C** in $CDCl_3$ (*) at 25 ^{o}C.

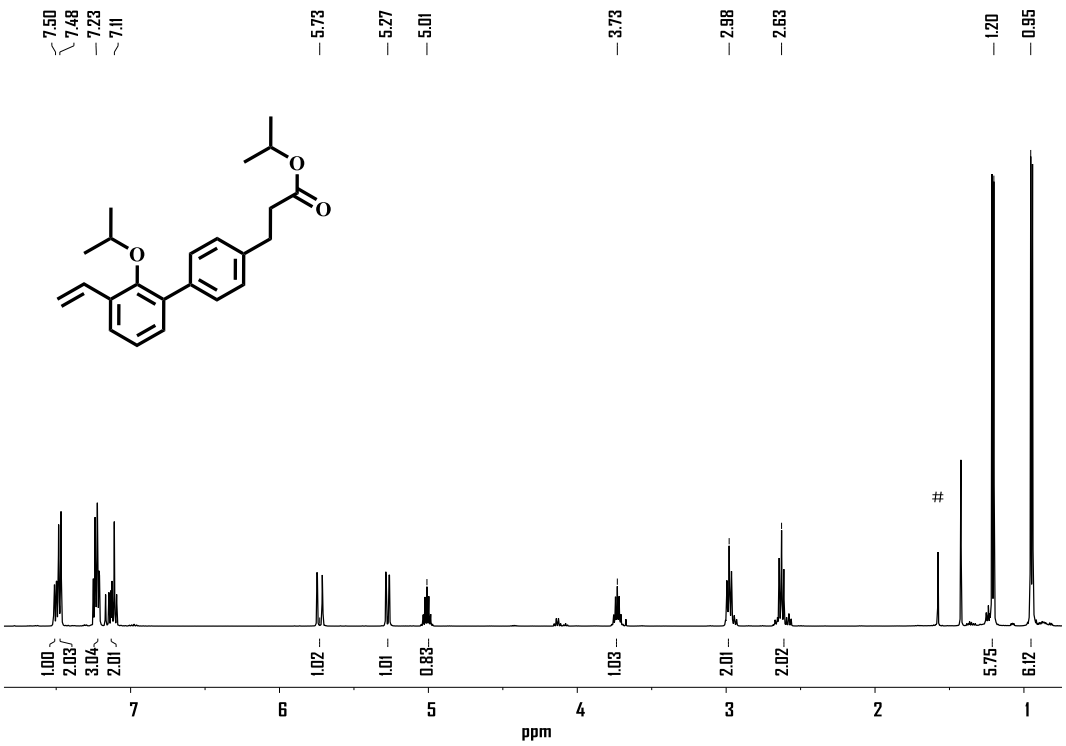

Figure S7. ^{1}H NMR spectrum (500 MHz) of complex **D** in $CDCl_3$ (*) at 25 ^{o}C. (**#** H_2O)

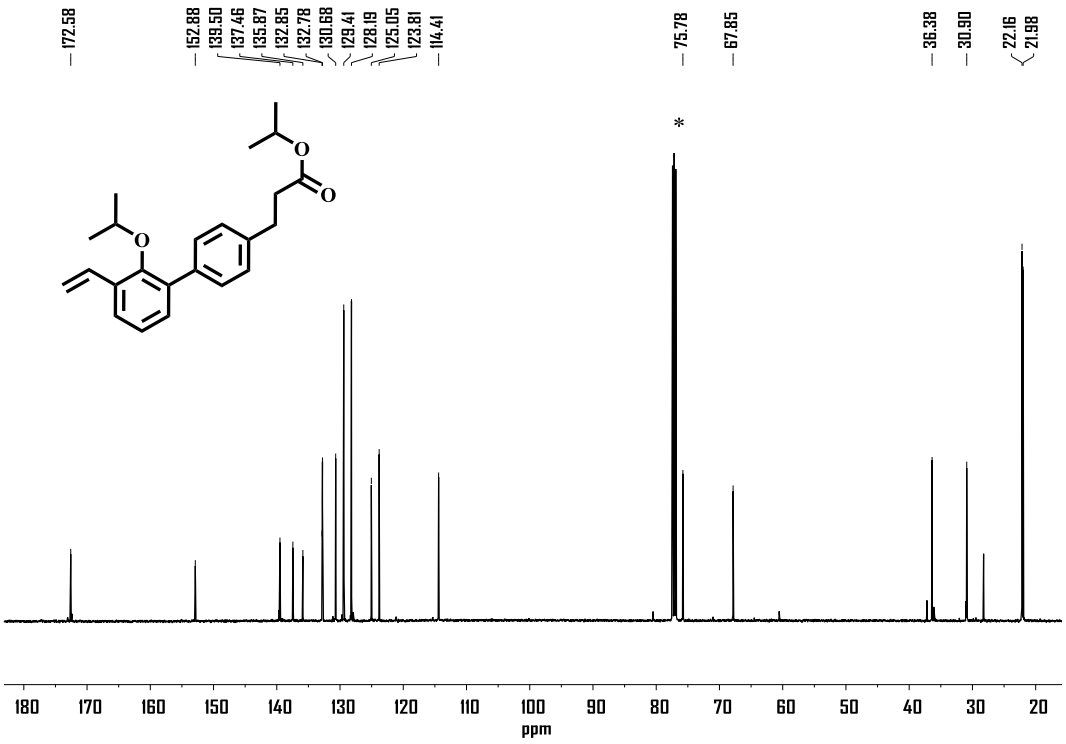

Figure S8. $^{13}C\{^{1}H\}$ NMR spectrum (125 MHz) of complex **D** in $CDCl_3$ (*) at 25 ^{o}C.

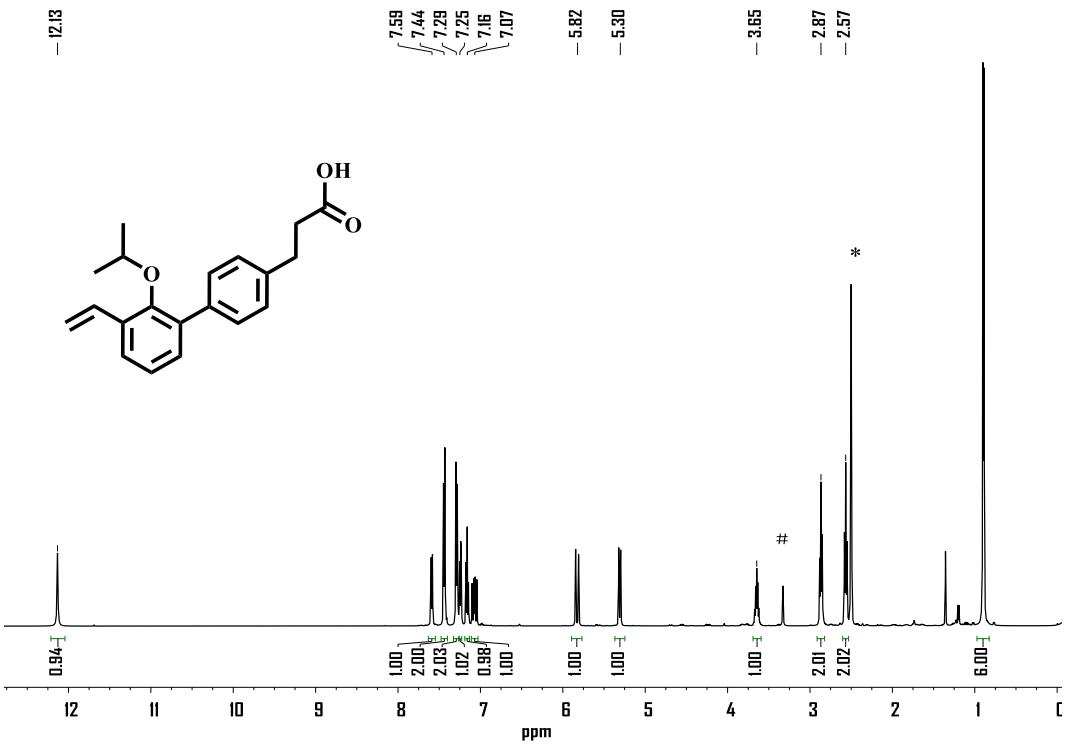

Figure S9. ^{1}H NMR spectrum (500 MHz) of complex **E** in DMSO-d_6 (*) at 25 ^{o}C. ($^{\#}H_2O$)

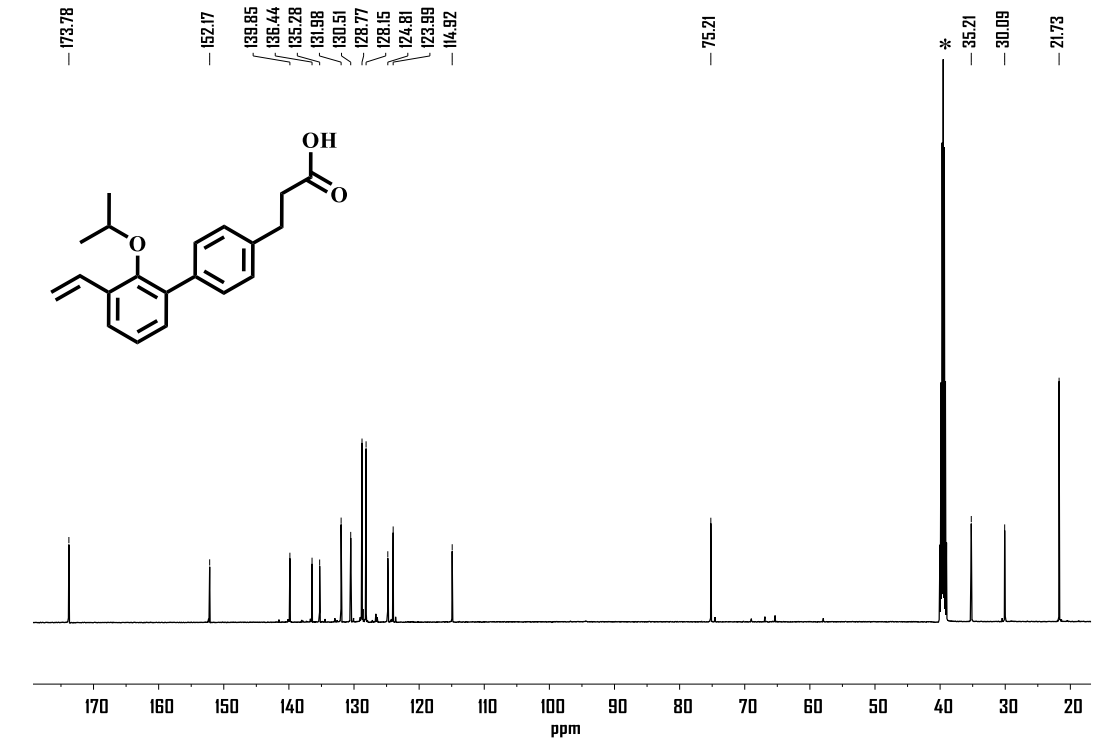

Figure S10. $^{13}C\{^{1}H\}$ NMR spectrum (125 MHz) of complex **E** in DMSO-d_6 (*) at 25 ^{o}C.

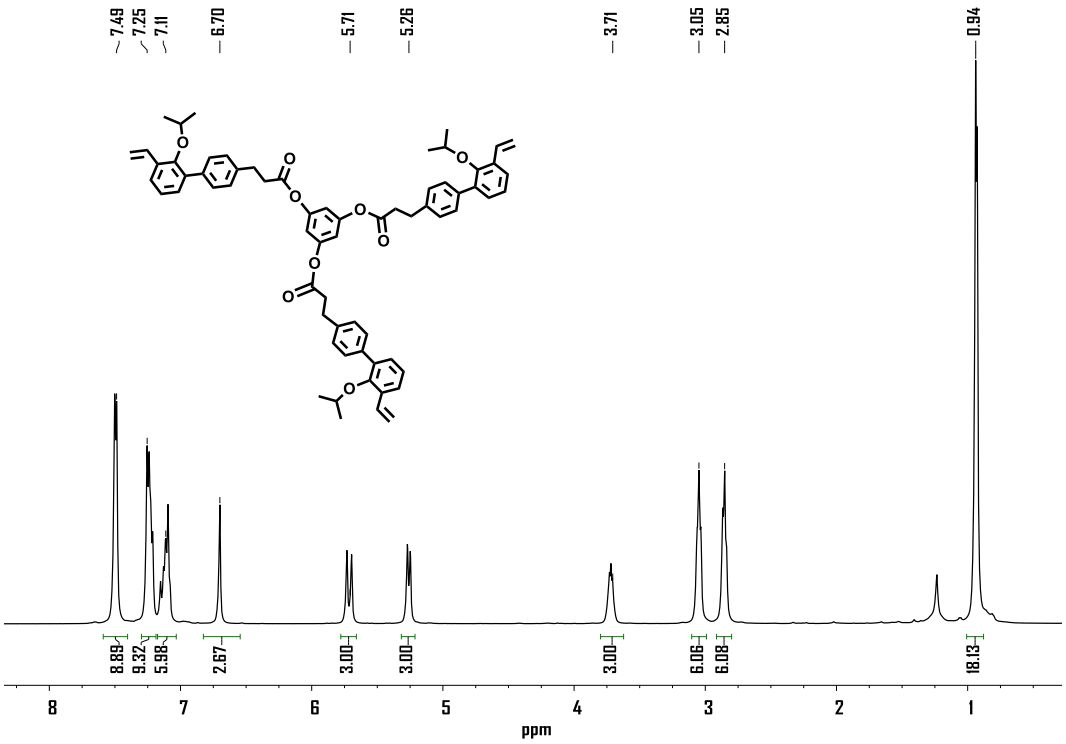

Figure S11. ^{1}H NMR spectrum (500 MHz) of complex **F** in $CDCl_3$ (*) at 25 ^{o}C.

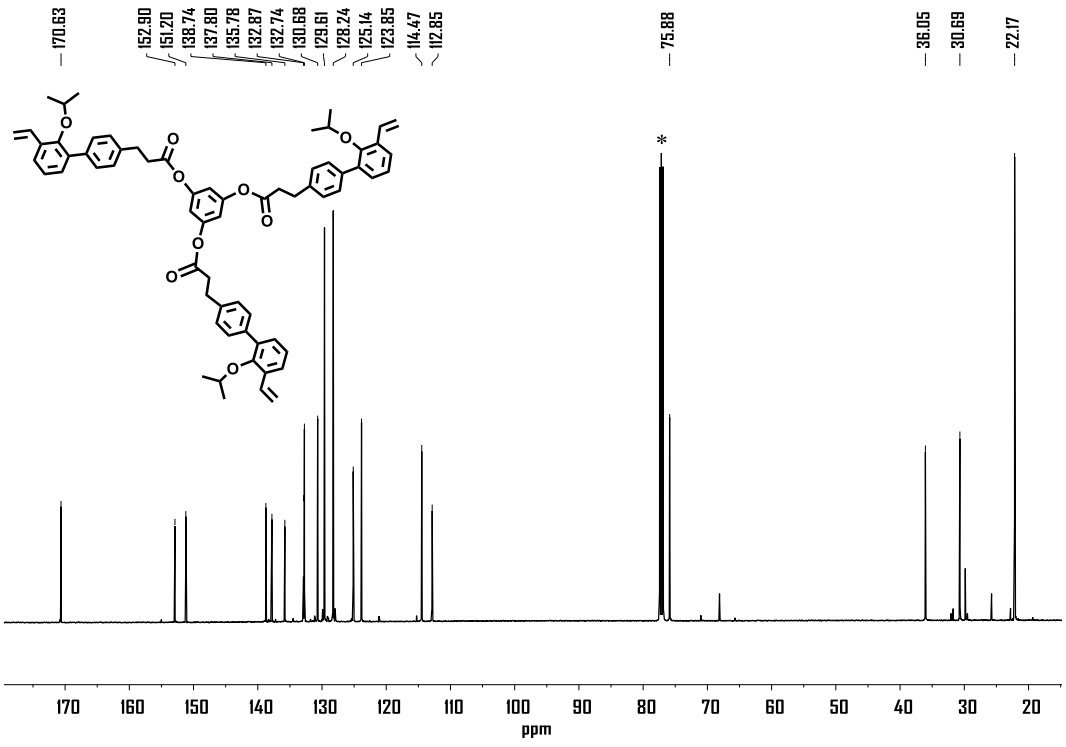

Figure S12. $^{13}C\{^{1}H\}$ NMR spectrum (125 MHz) of complex **F** in $CDCl_3$ (*) at 25 ^{o}C.

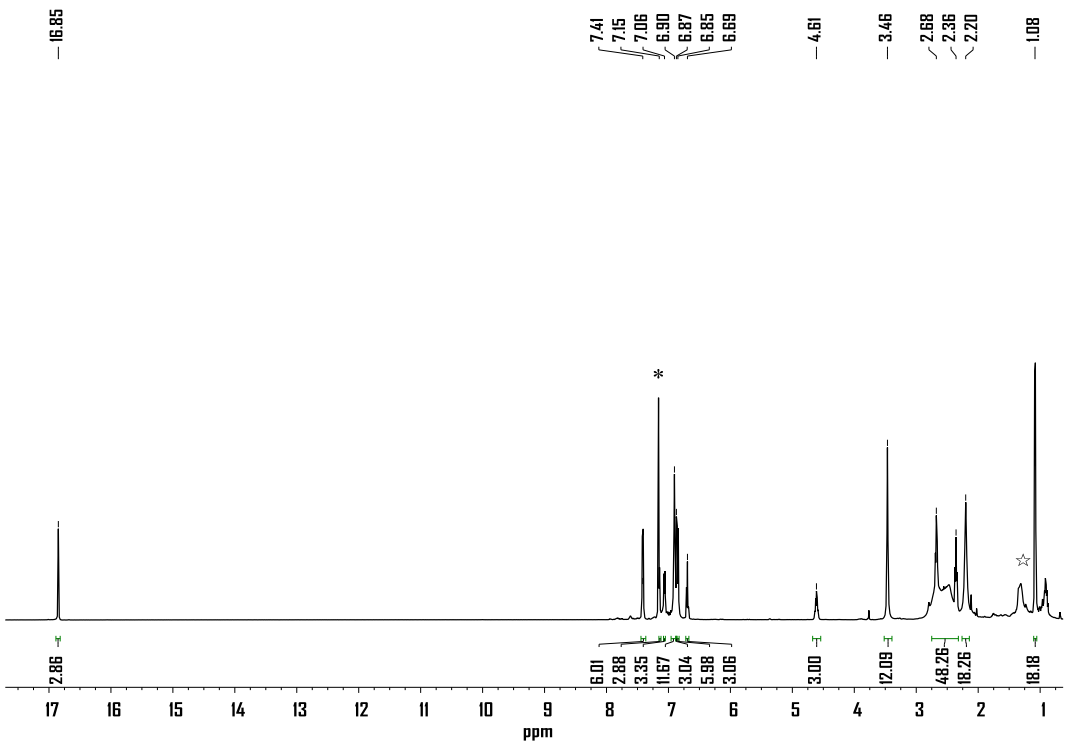

Figure S13. ^{1}H NMR spectrum (500 MHz) of complex **IV** in C_6D_6 (*) at 25 °C. (☆Hexane).

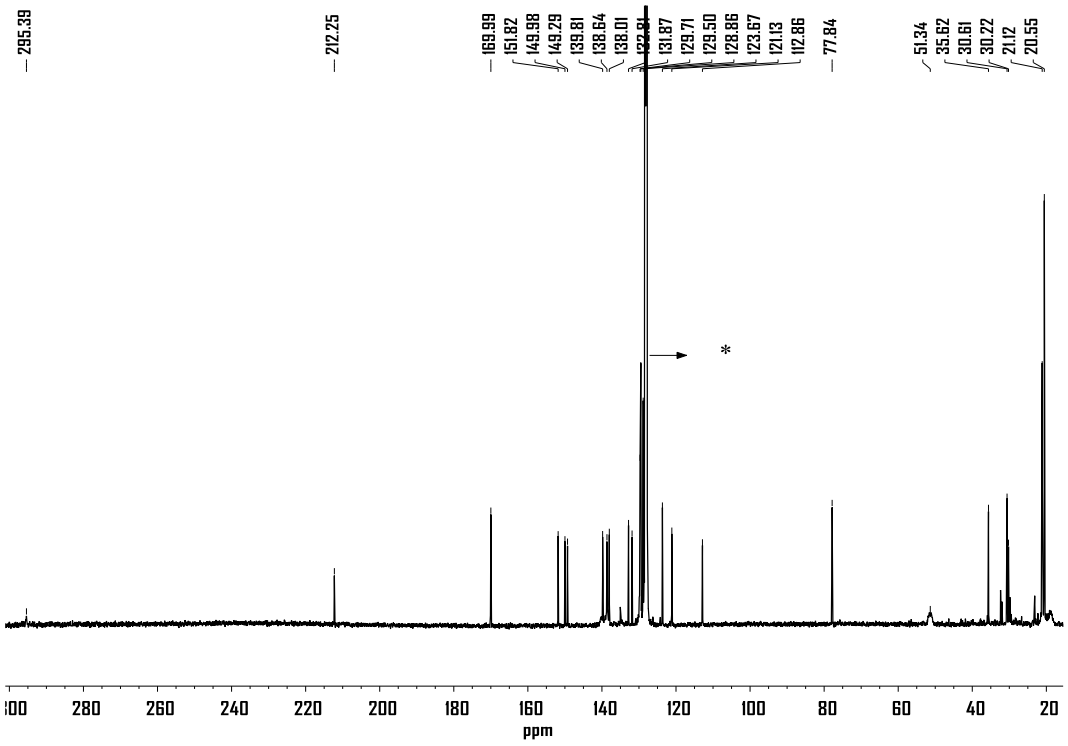

Figure S14. $^{13}C\{^{1}H\}$ NMR spectrum (125 MHz) of complex **IV** in C_6D_6 (*) at 25 °C.

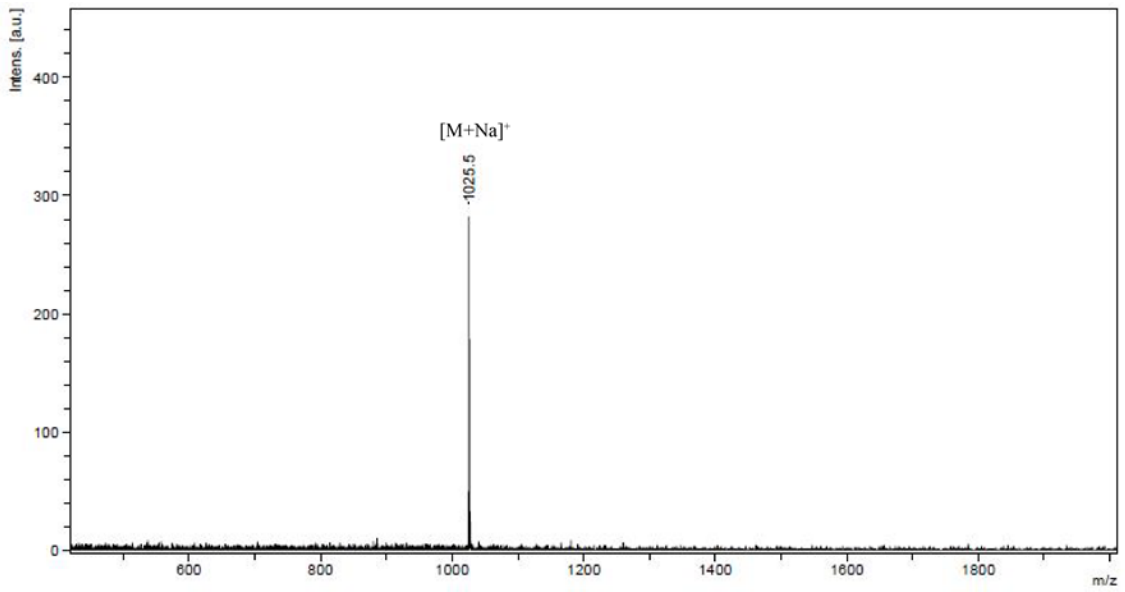

Figure S15. MALDI-TOF of complex **F**.

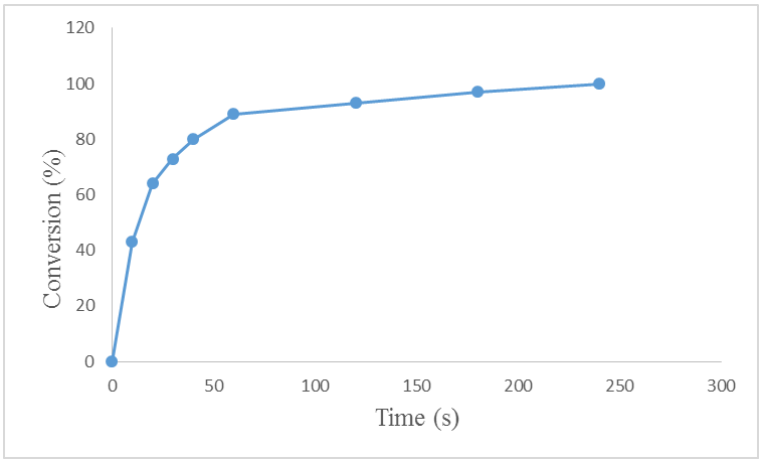

Figure S16. ROMP of monomer 1 in the presence of catalysts III. Conditions: Monomer/catalyst ratio 100:1, 0.3 mM (catalyst concentration) in toluene at room temperature. Conversion was determined by ^{1}H NMR.

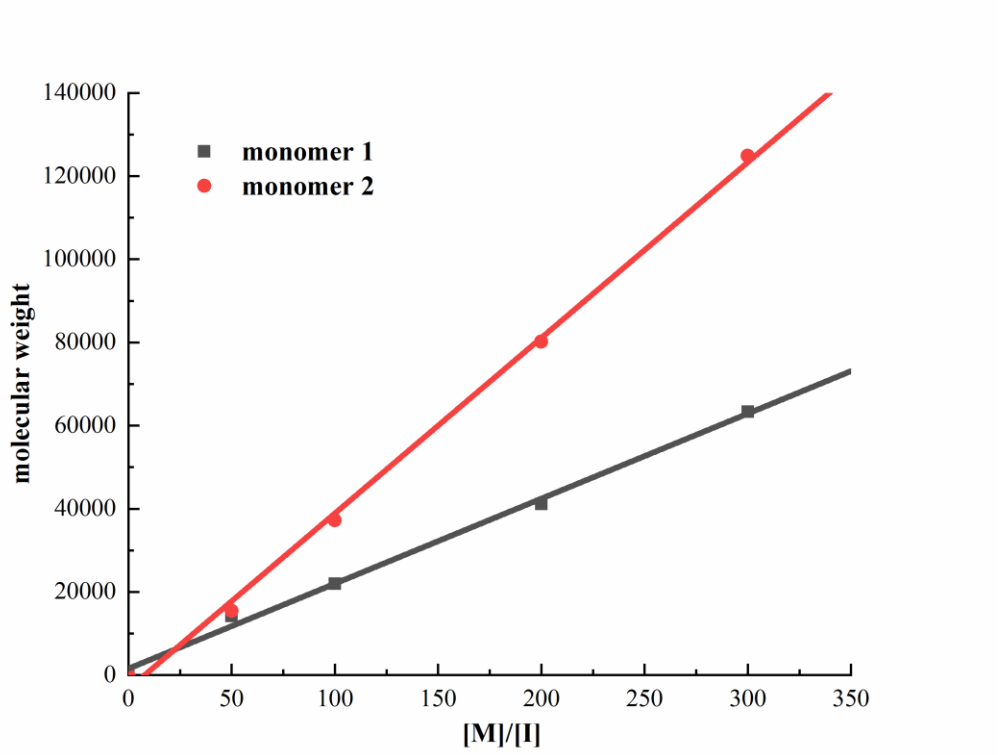

Figure S17. M_n versus M/I for the polymers produced from monomer **1** and **2** by using catalyst III.

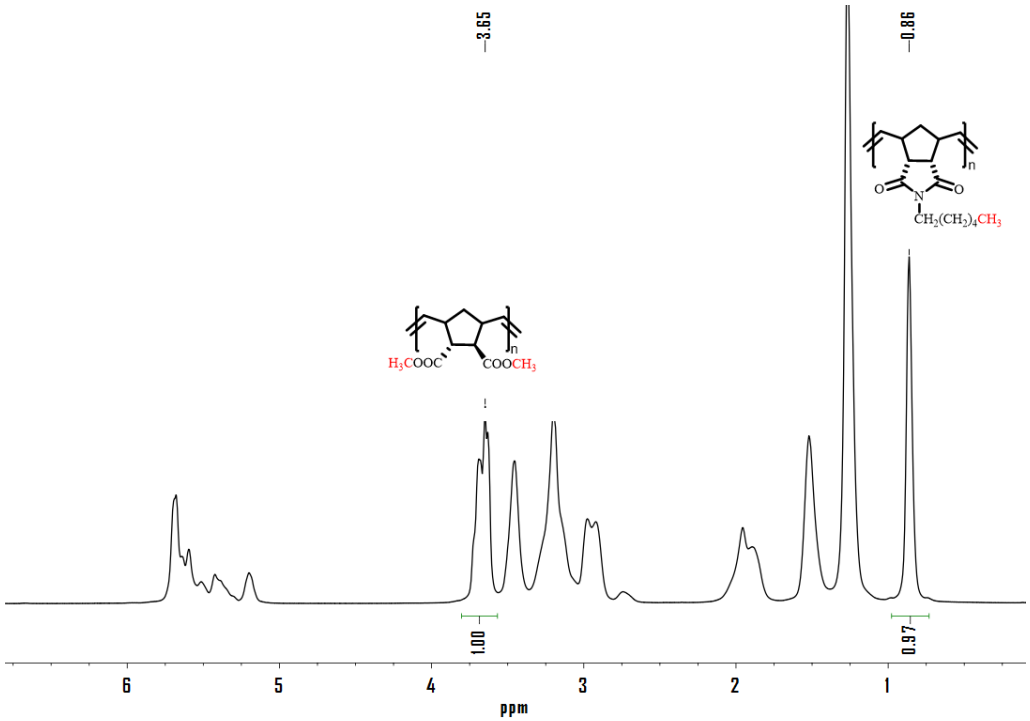

Figure S18. ^{1}H NMR spectrum (500 MHz) of poly[(**1**)$_{100}$-*b*-(**4**)$_{200}$] in $CDCl_3$ at 25 ^{o}C.

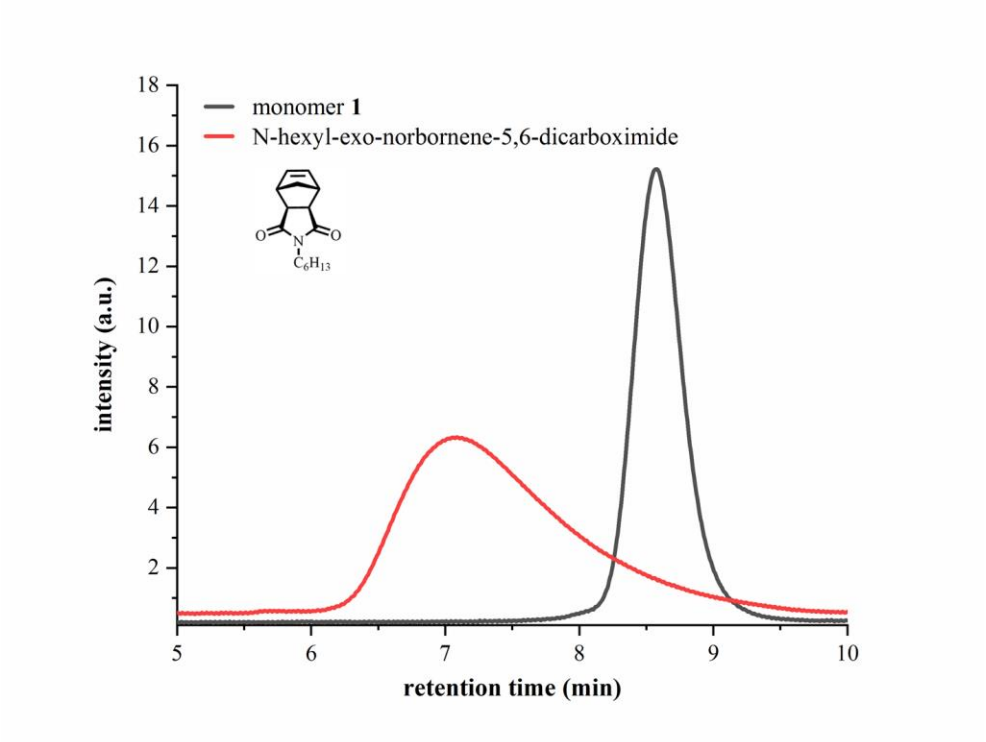

Figure S19. SEC traces of monomer **1** and N-hexyl-*exo*-norbornene-5, 6-dicarboximide

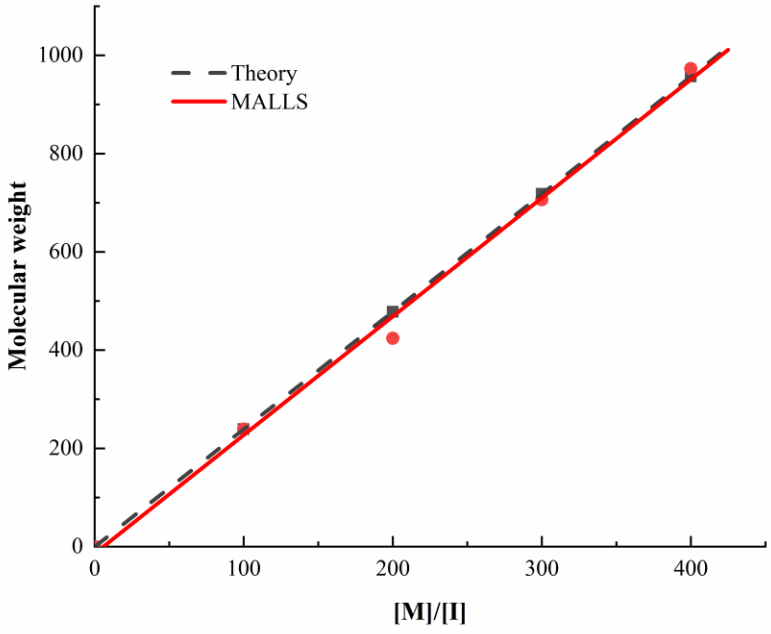

Figure S20. Plots of theoretical molecular weight and absolute molecular weight determined by MALLS-RI detector versus [M]/[I] for dendrimer **5** and using **Ⅳ** as catalyst.