Supporting Information for

Rare-earth metal bis(alkyl) complexes bearing pyrrolidinyl-functionalized cyclopentadienyl, indenyl and fluorenyl ligands: synthesis, characterization and ligand effect on isoprene polymerization

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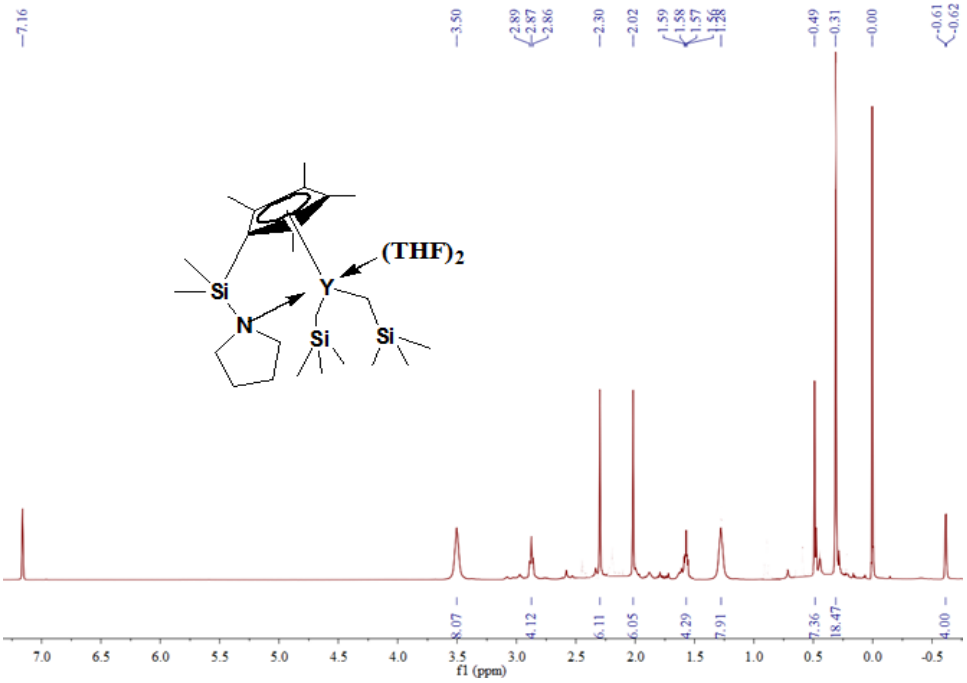

Fig. S1 ^{1}H NMR spectrum of $(C_5Me_4SiMe_2NC_4H_8)Y(CH_2SiMe_3)_2(THF)_2$ (**1**)

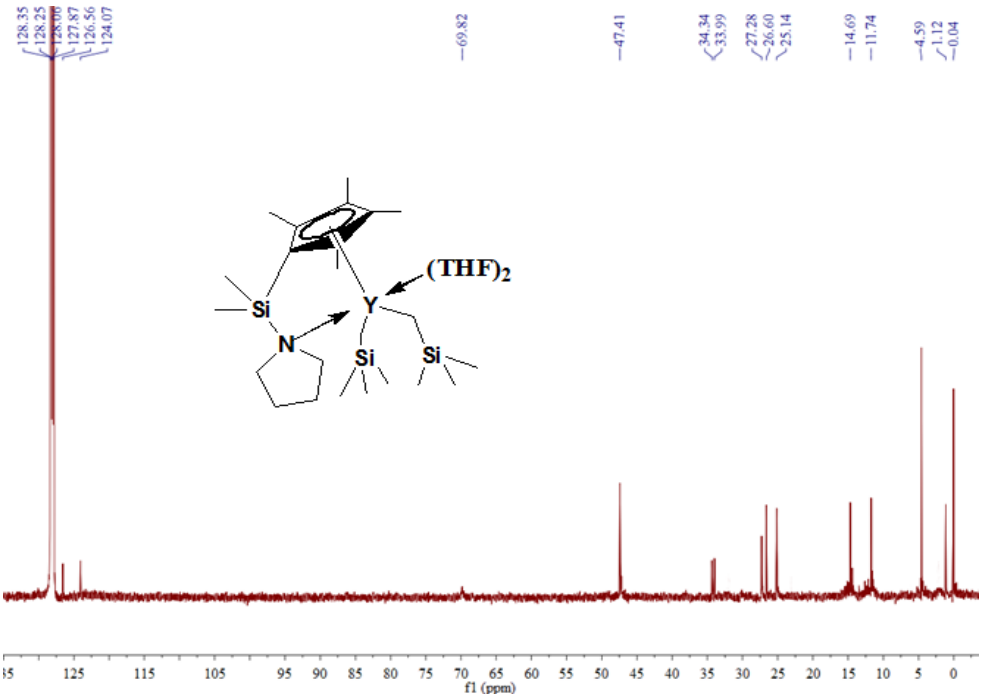

Fig. S2 ^{13}C NMR spectrum of $(C_5Me_4SiMe_2NC_4H_8)Y(CH_2SiMe_3)_2(THF)_2$ (**1**)

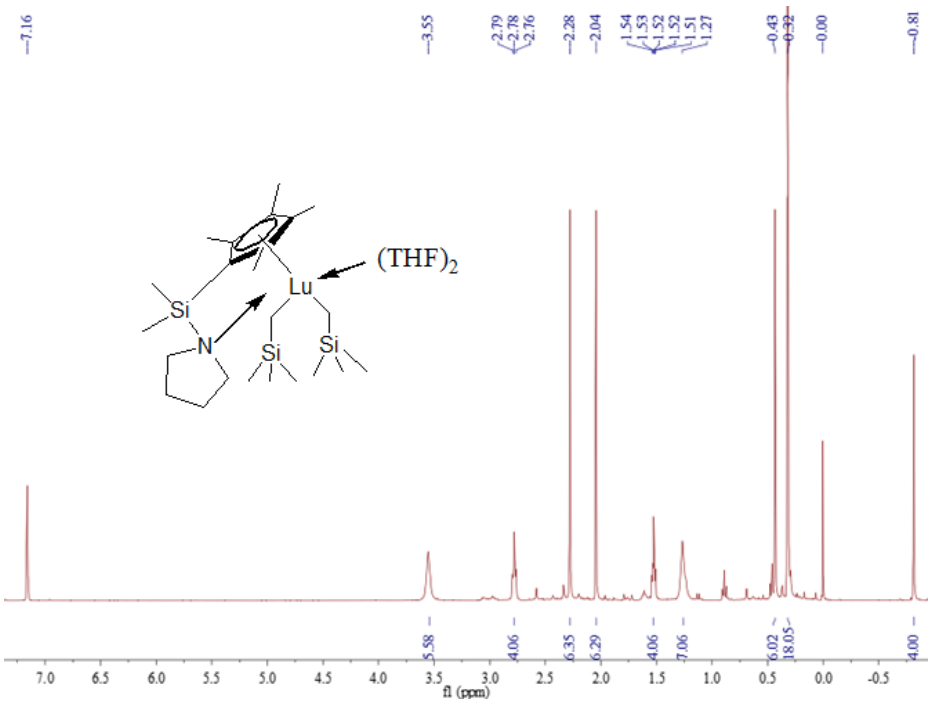

Fig. S3 ^{1}H NMR spectrum of $(C_5Me_4SiMe_2NC_4H_8)Lu(CH_2SiMe_3)_2(THF)_2$ (**2**)

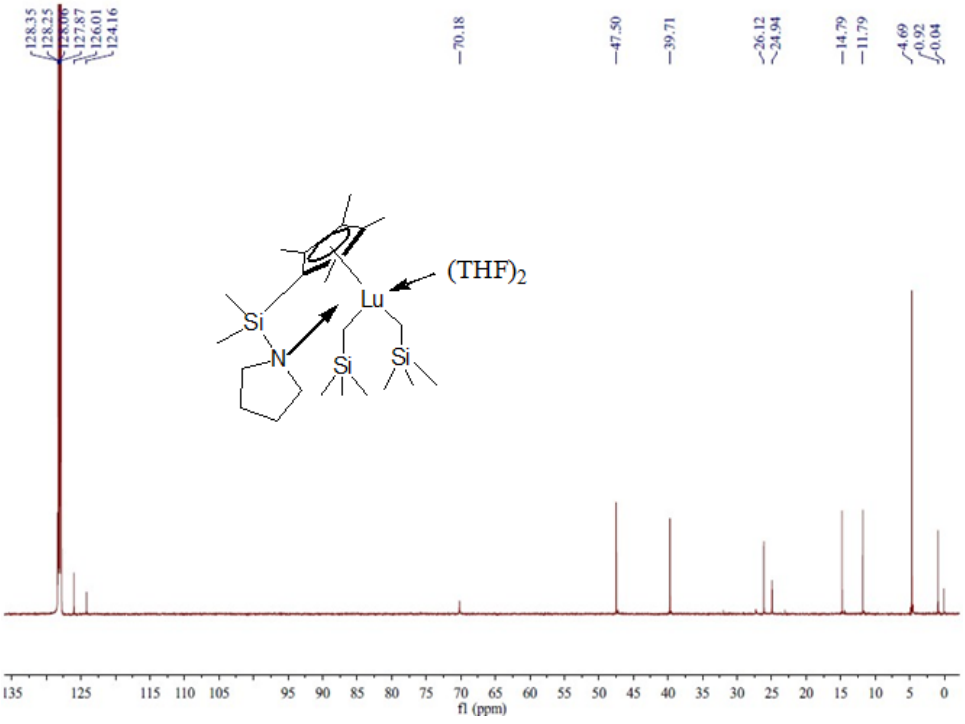

Fig. S4 ^{13}C NMR spectrum of $(C_5Me_4SiMe_2NC_4H_8)Lu(CH_2SiMe_3)_2(THF)_2$ (**2**)

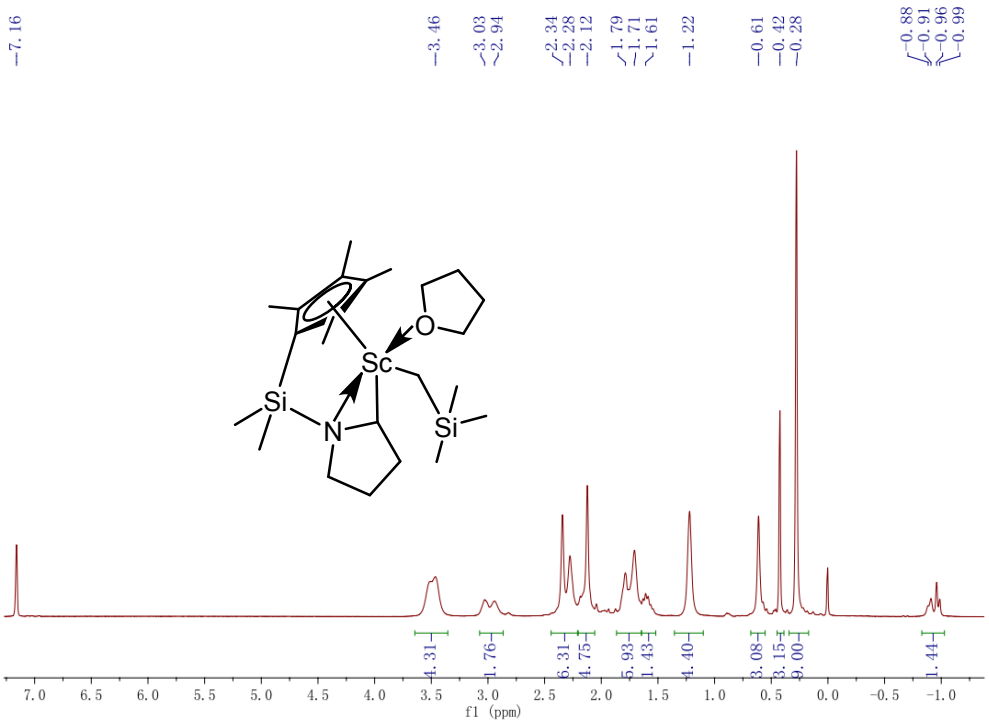

Fig. S5 ^{1}H NMR spectrum of $(C_5Me_4SiMe_2NC_4H_7)Sc(CH_2SiMe_3)(THF)$ (**3**)

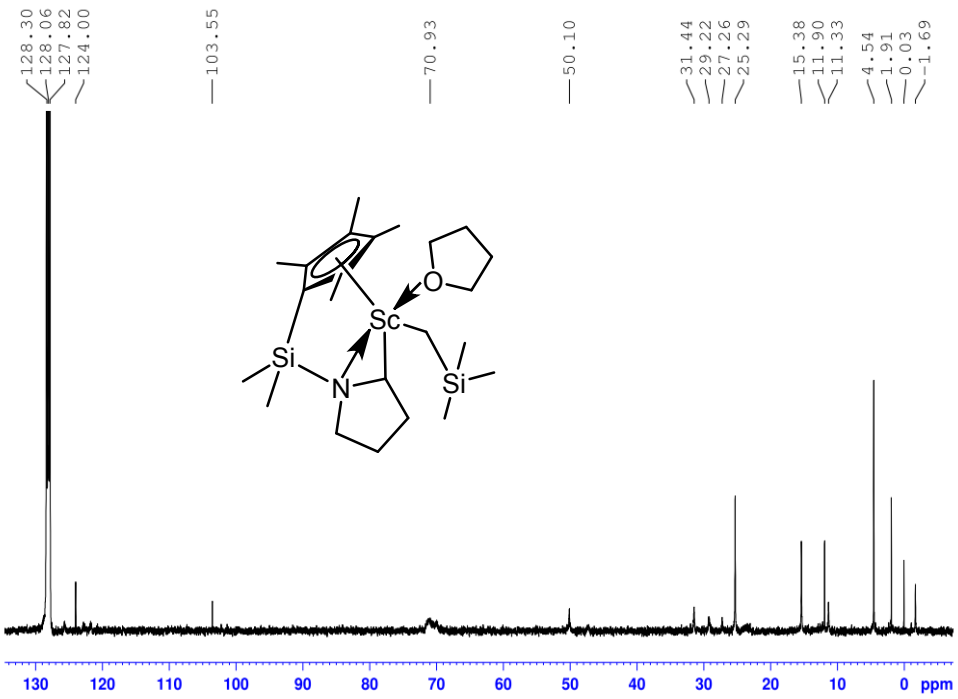

Fig. S6 ^{13}C NMR spectrum of $(C_5Me_4SiMe_2NC_4H_7)Sc(CH_2SiMe_3)(THF)$ (**3**)

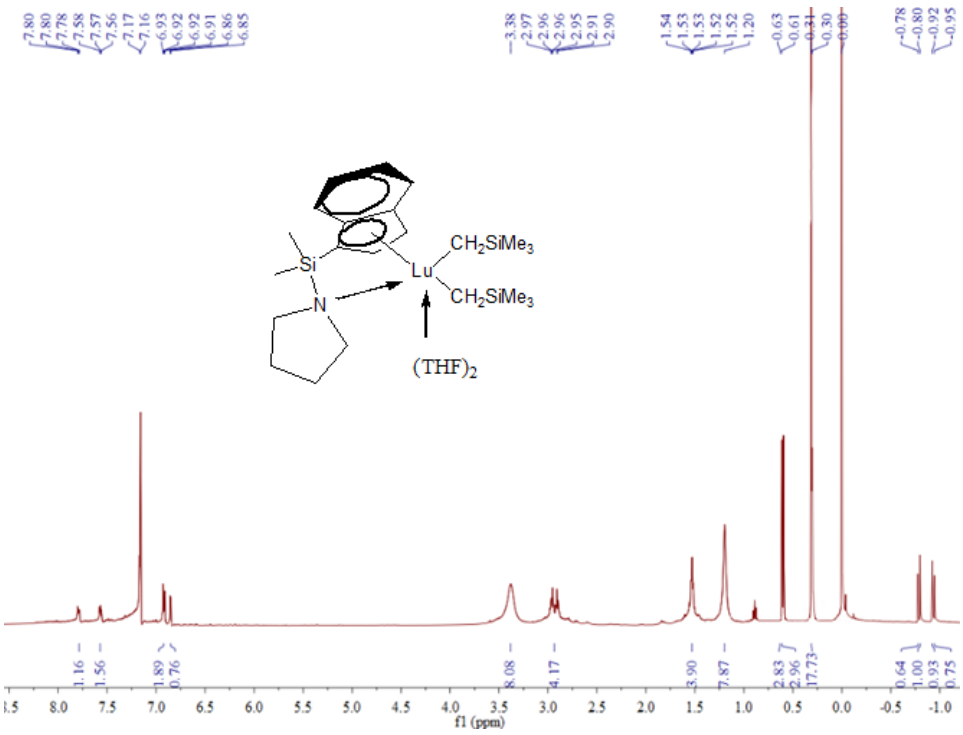

Fig. S7 ^{1}H NMR spectrum of $[C_9H_6SiMe_2NC_4H_8]Lu(CH_2SiMe_3)_2(THF)_2$ (**4**)

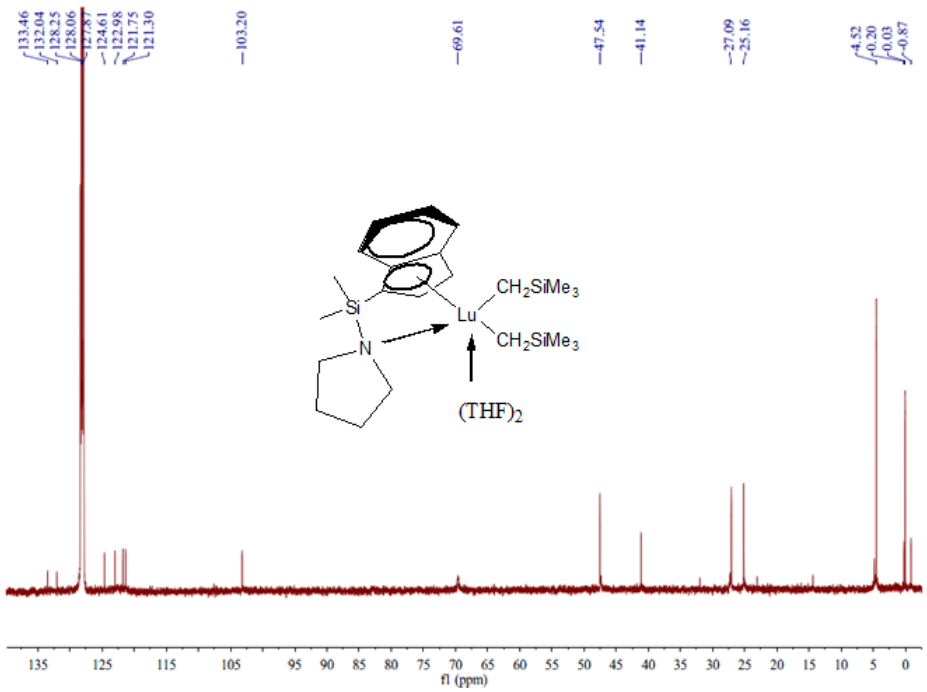

Fig. S8 ^{13}C NMR spectrum of $[C_9H_6SiMe_2NC_4H_8]Lu(CH_2SiMe_3)_2(THF)_2$ (**4**)

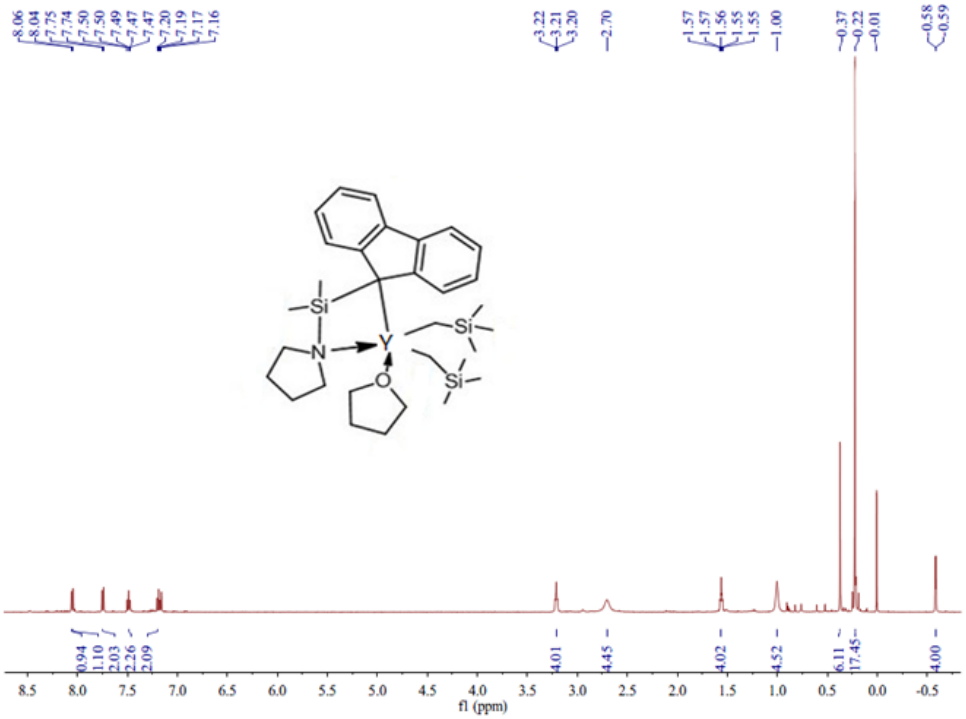

Fig. S9 ^{1}H NMR spectrum of $(C_{13}H_8SiMe_2NC_4H_8)Y(CH_2SiMe_3)_2(THF)$ (**5**)

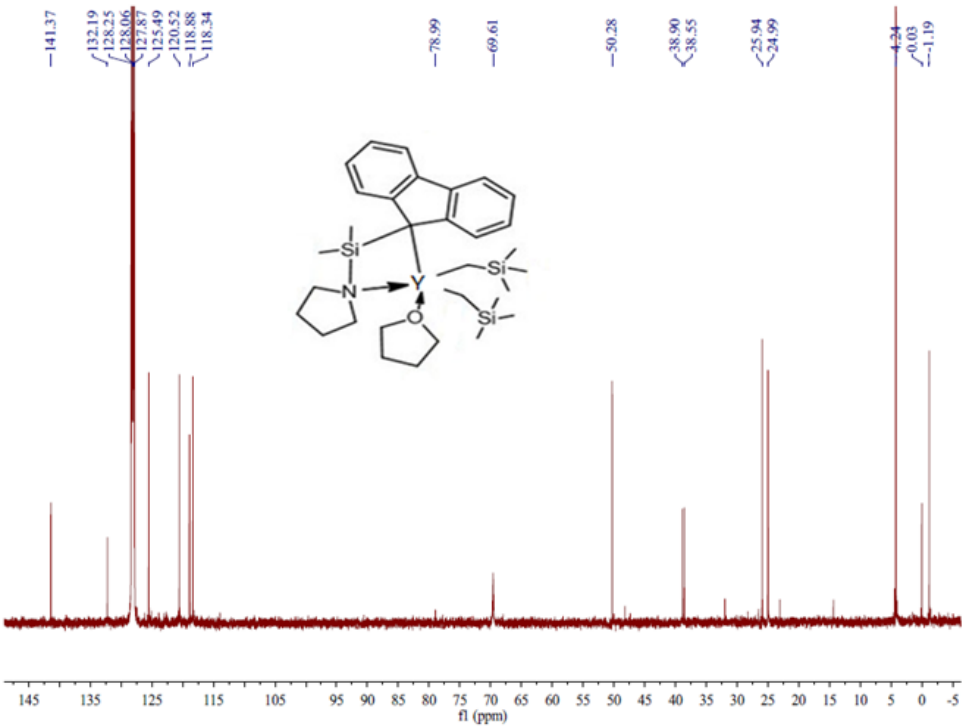

Fig. S10 ^{13}C NMR spectrum of $(C_{13}H_8SiMe_2NC_4H_8)Y(CH_2SiMe_3)_2(THF)$ (**5**)

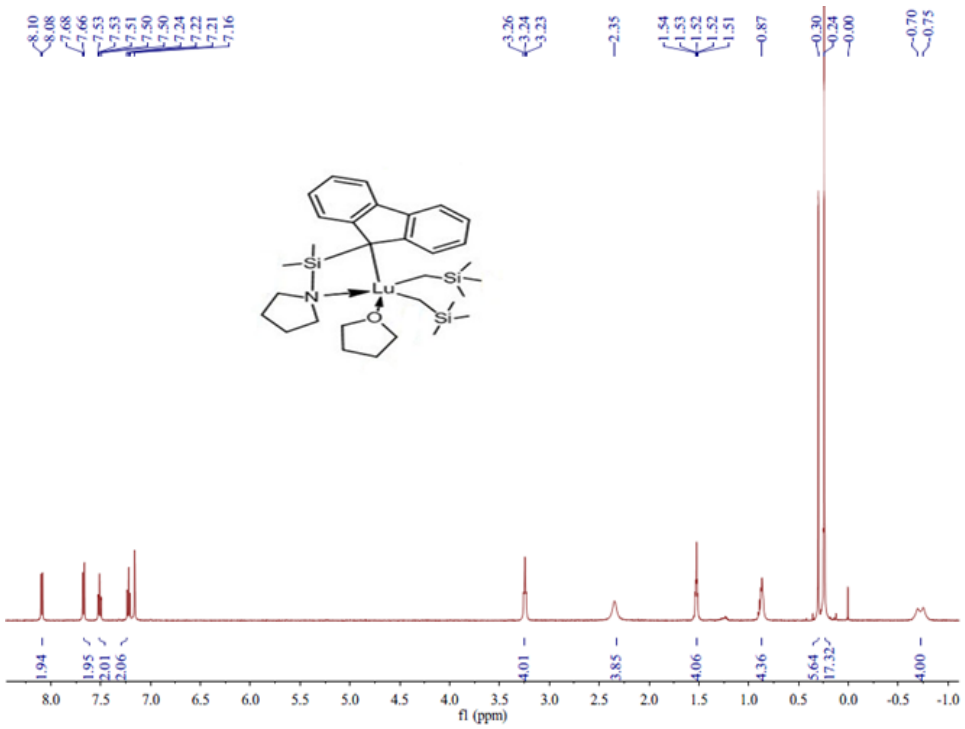

Fig. S11 ^{1}H NMR spectrum of $(C_{13}H_8SiMe_2NC_4H_8)Lu(CH_2SiMe_3)_2(THF)$ (**6**)

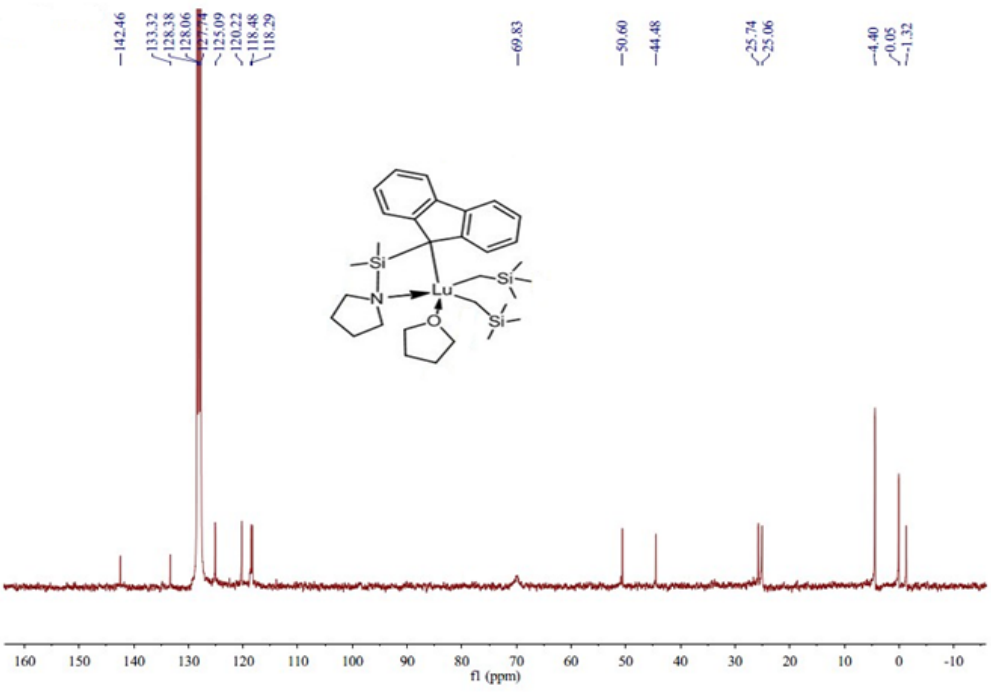

Fig. S12 ^{13}C NMR spectrum of $(C_{13}H_8SiMe_2NC_4H_8)Lu(CH_2SiMe_3)_2(THF)$ (**6**)

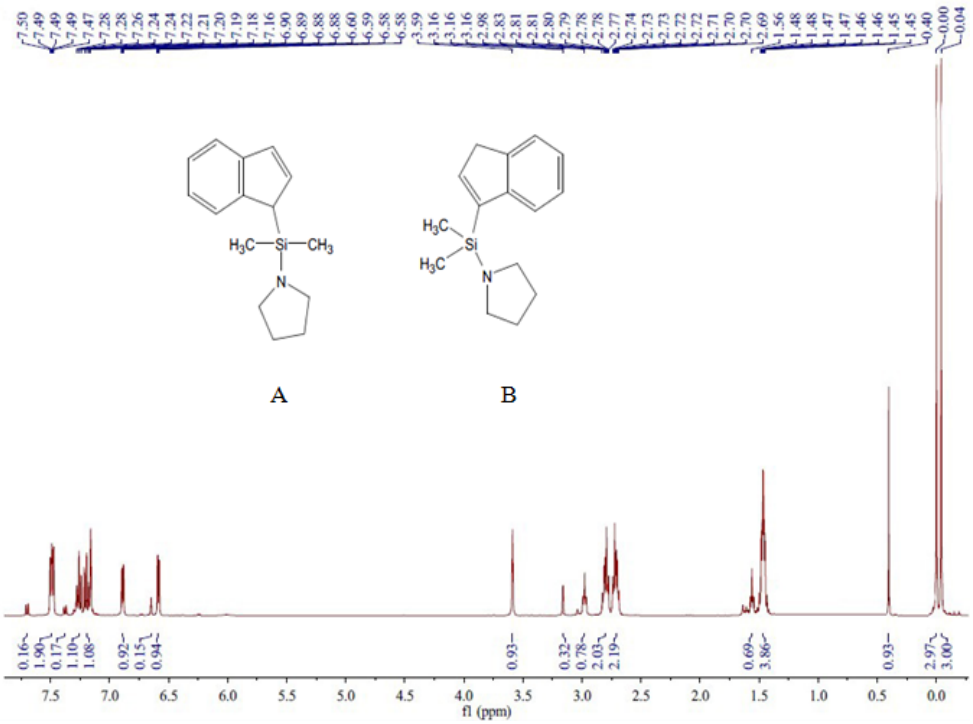

Fig. S13 ^{1}H NMR spectrum of $C_9H_6SiMe_2NC_4H_8$

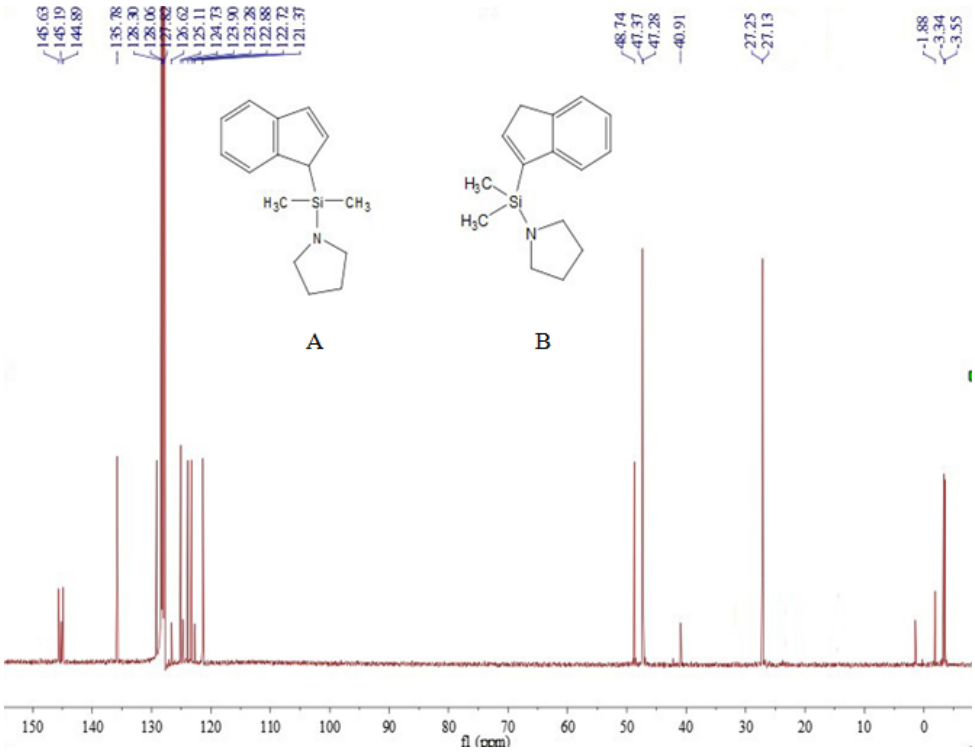

Fig. S14 ^{13}C NMR spectrum of $C_9H_6SiMe_2NC_4H_8$

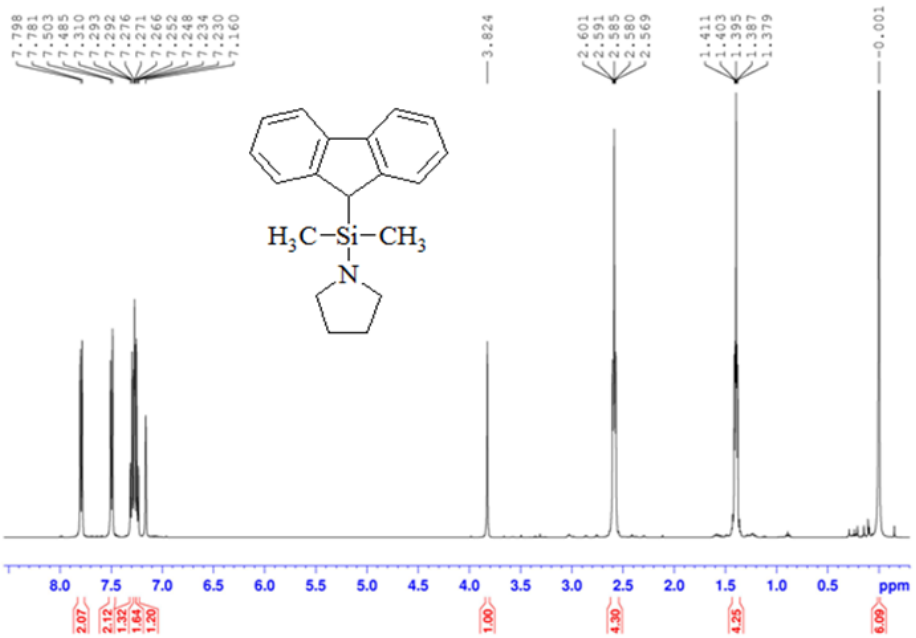

Fig. S15 ^{1}H NMR spectrum of $C_{13}H_9SiMe_2NC_4H_8$

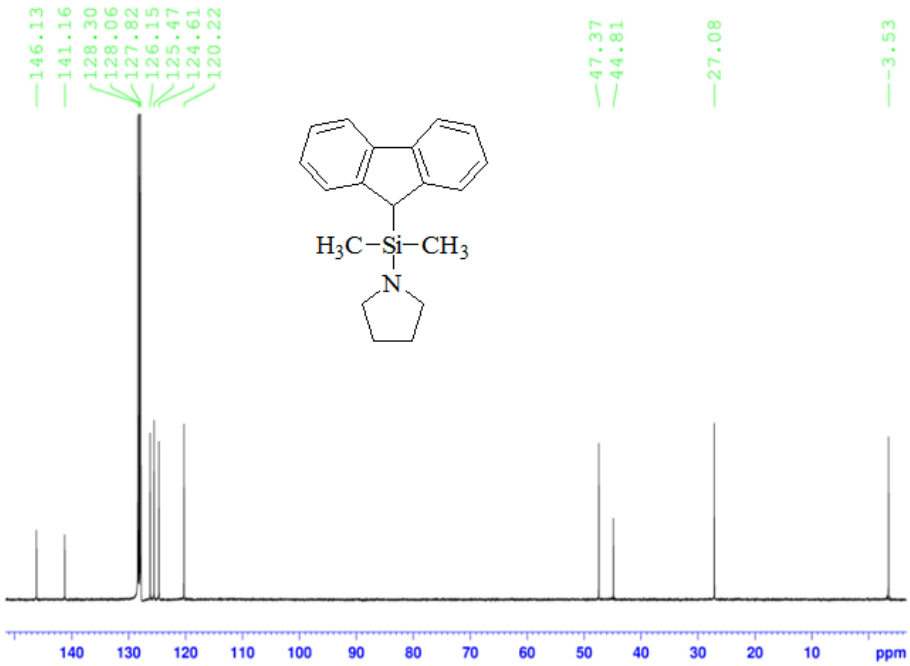

Fig. S16 ^{13}C NMR spectrum of $C_{13}H_9SiMe_2NC_4H_8$

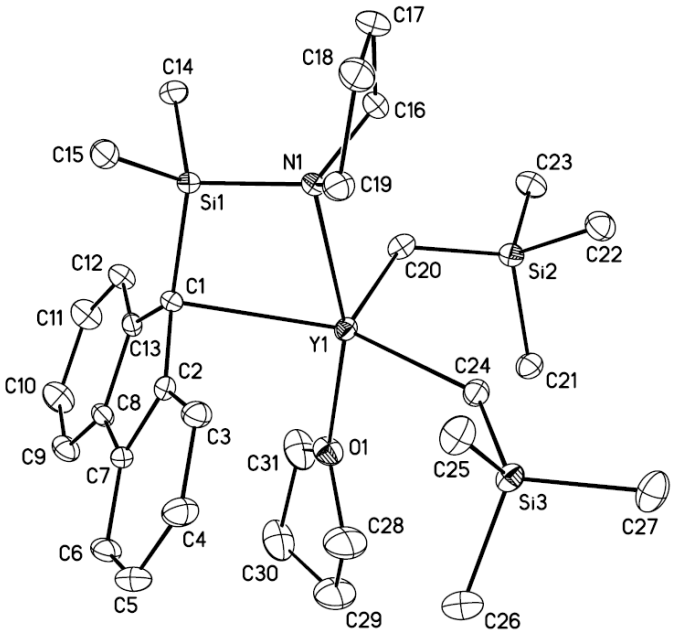

Fig. S17 Molecular structure of **5** with thermal ellipsoids at 20% probability. Hydrogen atoms are omitted for clarity. Selected bond distances (Å) and bond angles (°) for **5**: Y1-C1 = 2.564(3), Y1-C2 = 2.887(3), Y1-C20 = 2.386(3), Y1-C24 = 2.377(3), Y1-N1 = 2.525(2), Y1-O1 = 2.322(2), C24-Y1-C20 = 108.88(10), N1-Y1-C1 = 68.46 (8).

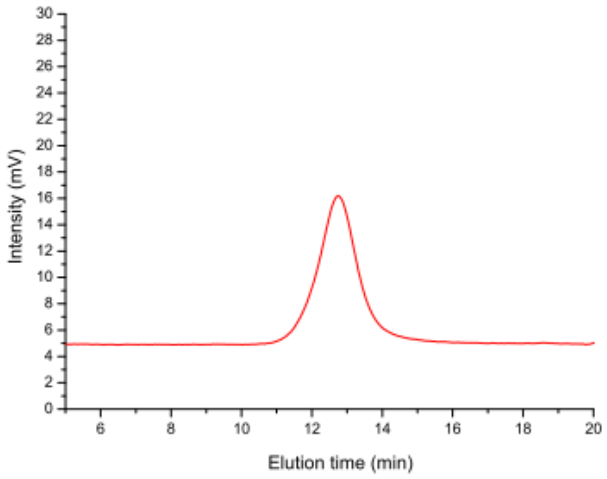

Fig. S18 GPC curve of the polymer sample

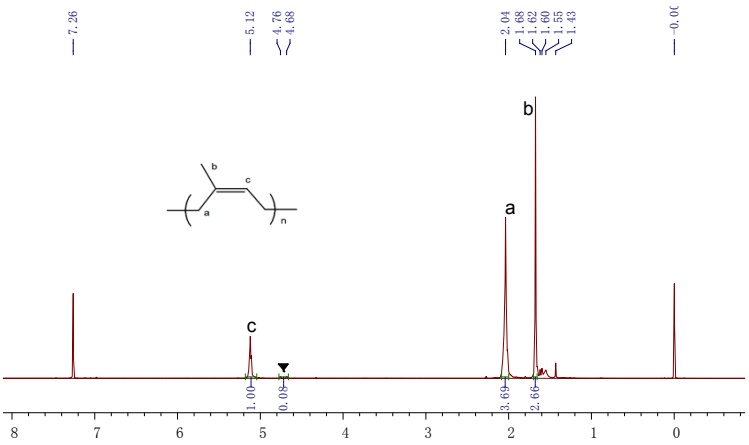

Fig. S19 ^{1}H NMR spectrum of the polymer sample

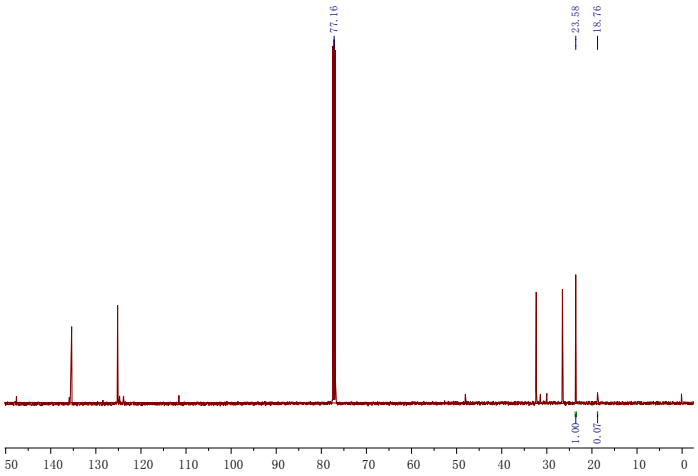

Fig. S20 ^{13}C NMR spectrum of the polymer sample