Supporting Information

Low reflective index, highly transparent, and ultra-low dielectric constant materials prepared via effective copolymerization of 4-methyl-1-pentene and a Si-containing *α,ω*-diolefin

Yafei Wang, [a] Dong Huang, [a] Xianhang Gao, [a] Fei Wang, [a] Hao Cai, [a] Li Pan *,[a] and Yuesheng Li[a]

[†]Tianjin Key Laboratory of Composite and Functional Materials, and School of Materials Science and Engineering, Tianjin University, Tianjin 300072, P. R. China

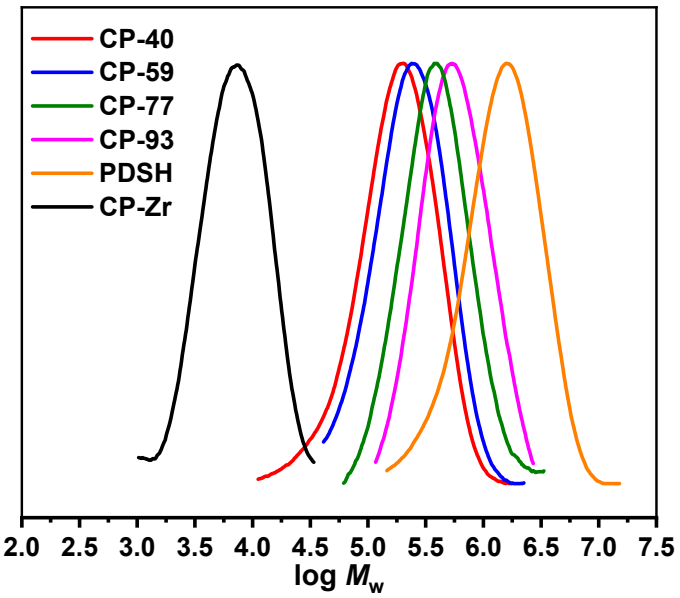

Figure S1. Molecular weight distribution curves of (co)polymers

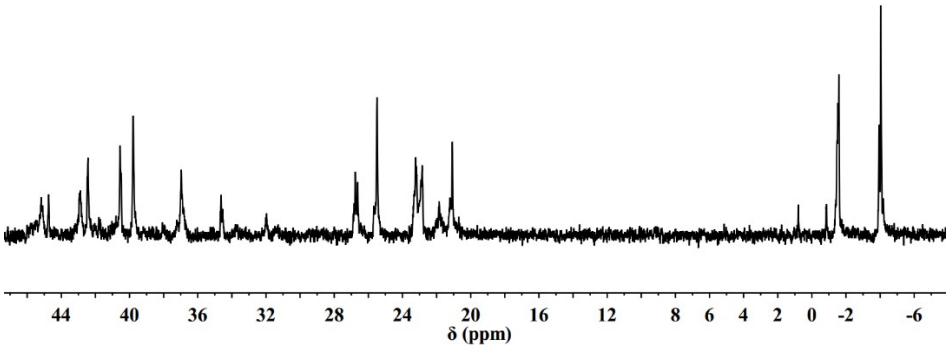

Figure S2. The ^{13}C NMR spectrum of CP-59.

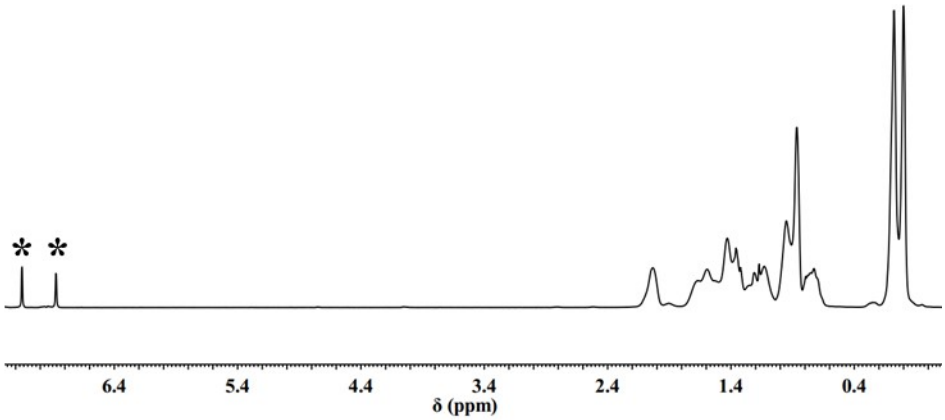

Figure S3. The ^{1}H NMR spectrum of CP-59 in *o*-dichlorobenzene.

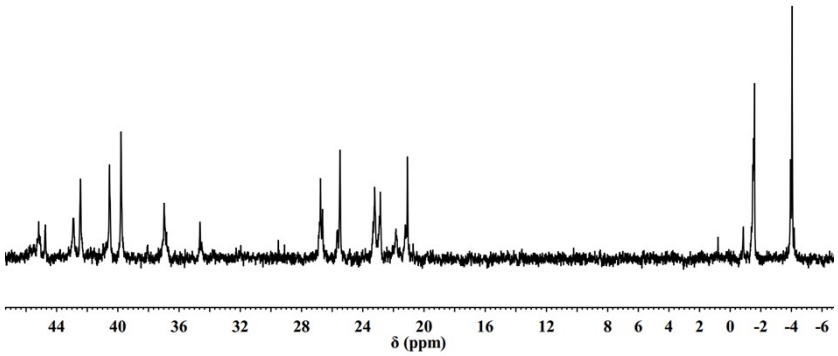

Figure S4. The ^{13}C NMR spectrum of CP-83.

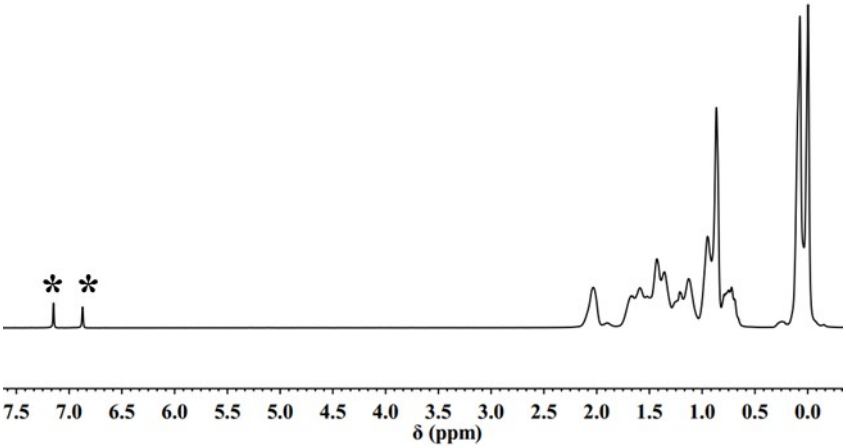

Figure S5. The ^{1}H NMR spectrum of CP-83 in *o*-dichlorobenzene.

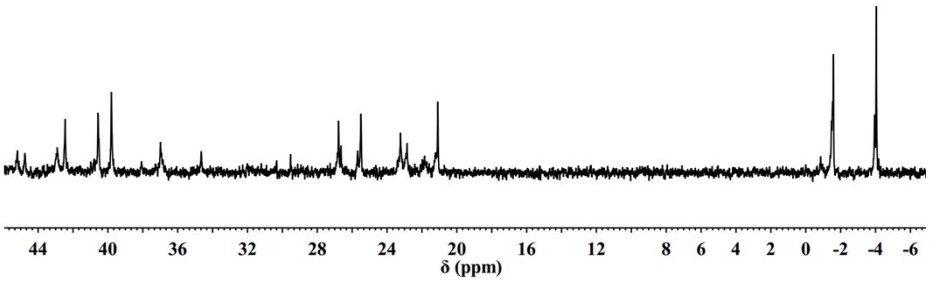

Figure S6. The ^{13}C NMR spectrum of CP-93.

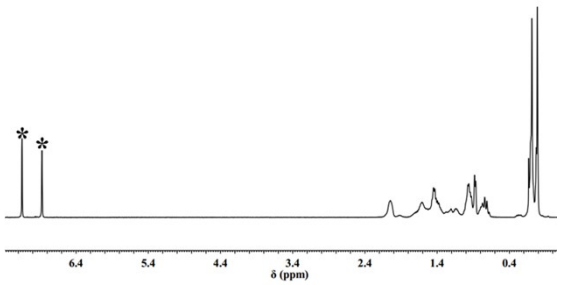

Figure S7. The ^{1}H NMR spectrum of CP-93 in *o*-dichlorobenzene.

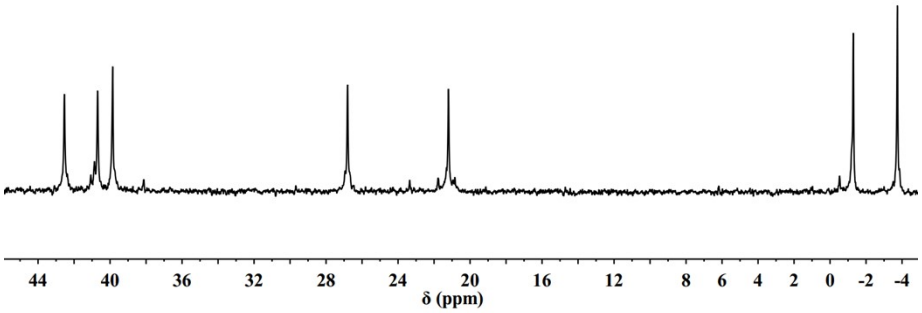

Figure S8. The ^{13}C NMR spectrum of PDSH.

Table S1. Copolymerization of 4-methyl-1-pentene with DSH at low concentration

[4M1P] [a] (mol/L)	[DSH] [b] (mol/L)	X [c]	Incorp. [d]	Y [e]	G [f]	F [f]
0.048	0.012	4.00	56%	0.76	-1.29	21.28
0.042	0.018	2.33	68%	0.47	-2.62	11.57
0.036	0.024	1.50	76%	0.32	-3.25	7.12
0.030	0.030	1.00	82%	0.22	-3.56	4.56
0.024	0.036	0.67	87%	0.12	-3.82	3.00

[a] Concentration of the copolymerized monomer 4M1P (mol/L); [b] Concentration of the copolymerized monomer DSH (mol/L). [c] X = M_{4M1P}/M_{DMSHD}; *d* Insertion ratio of DSH monomer as determined by ^{13}C NMR. [e] Y is the molar ratio of the monomer in the copolymerized product; [f] G = X(Y-1)/Y, F = X^2/Y, and the formula for calculating the competing polymerization rate of 4M1P (r_{4M1P}) and copolymerized DSH monomer (r_{DSH}) by the Finemann-Ross method is G = Fr_{4M1P}- r_{DSH}.

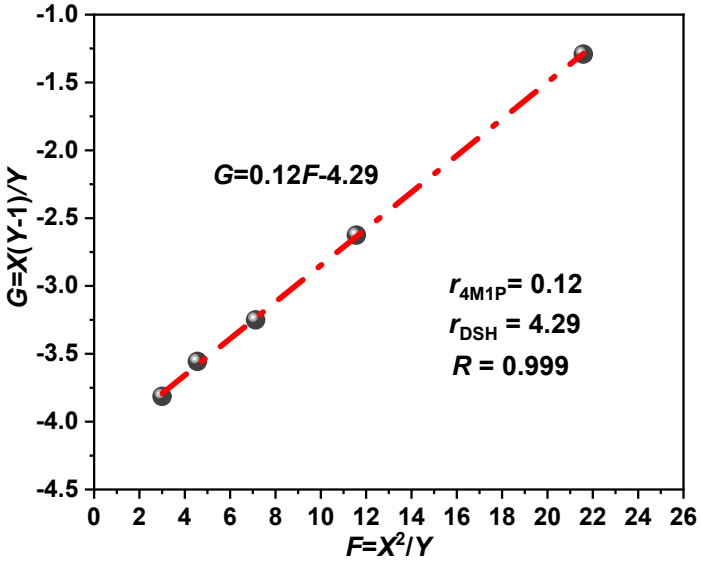

Figure S9. Competitive aggregation ratio curves of 4M1P versus DSH calculated using the Feldmann-Ross equation.

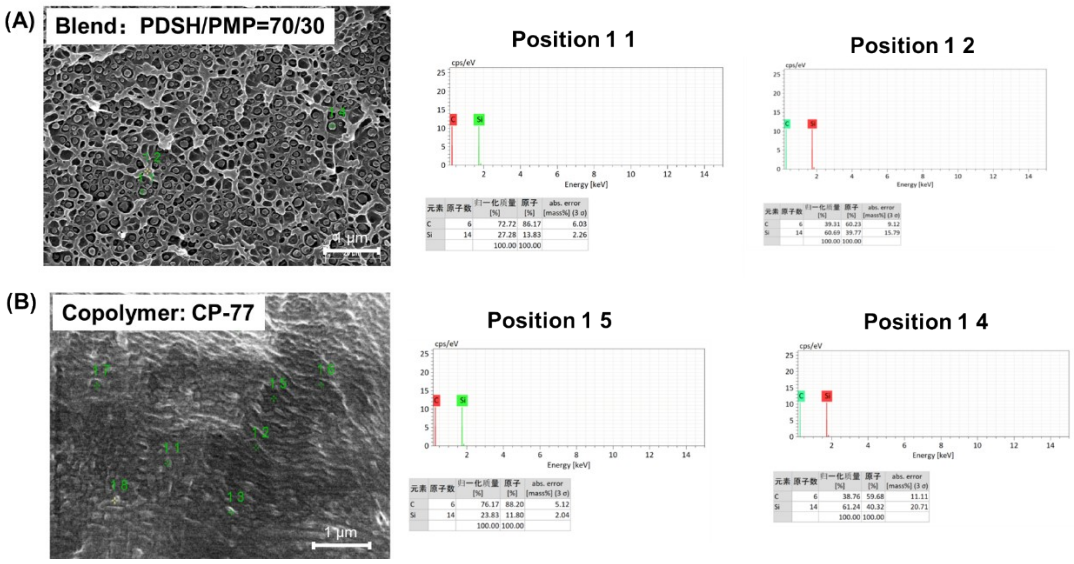

Figure S10. SEM micrographs of (A)blend: PDSH/PMP=70/30 blend (blend conditions: xylene, reflux temperature, 1 h) and (B) copolymer: CP-77, as well as EDX analysis result of representative positions.

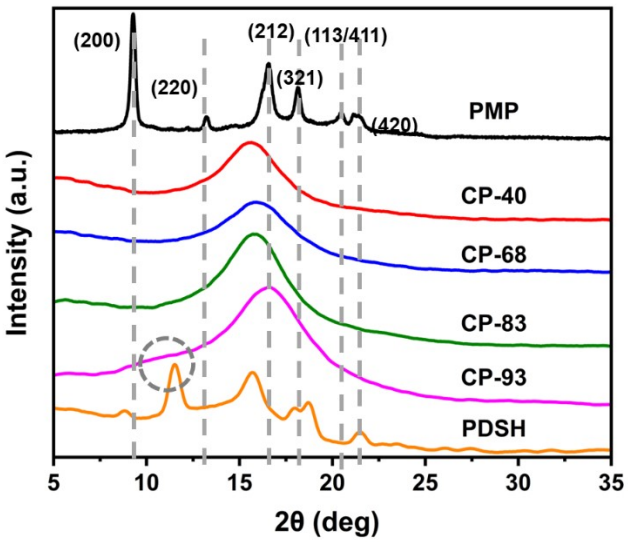

Figure S11. WAXD diffractograms of PMP, PDSH and copolymers measured at 25 ℃.

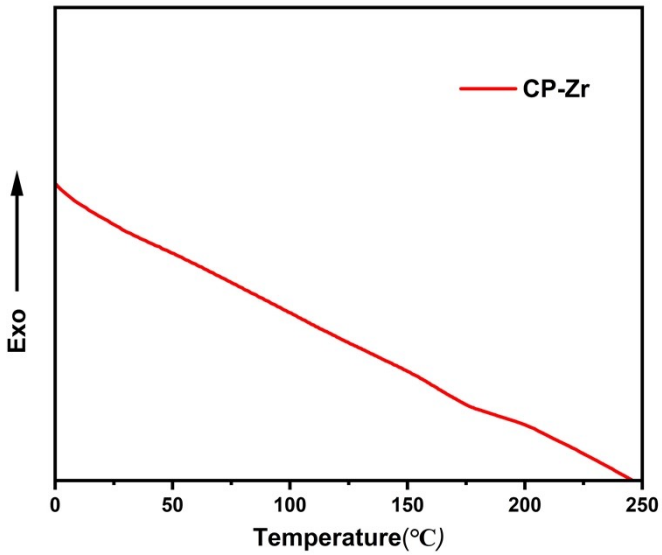

Figure S12. DSC thermogram of CP-Zr.