Electronic Supplementary Material (ESI) for Polymer Chemistry.

Chiral Helical Disubstituted polyacetylenes Construct Optically Active Particles through Precipitation Polymerization

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Preparation of monomer and crosslinker

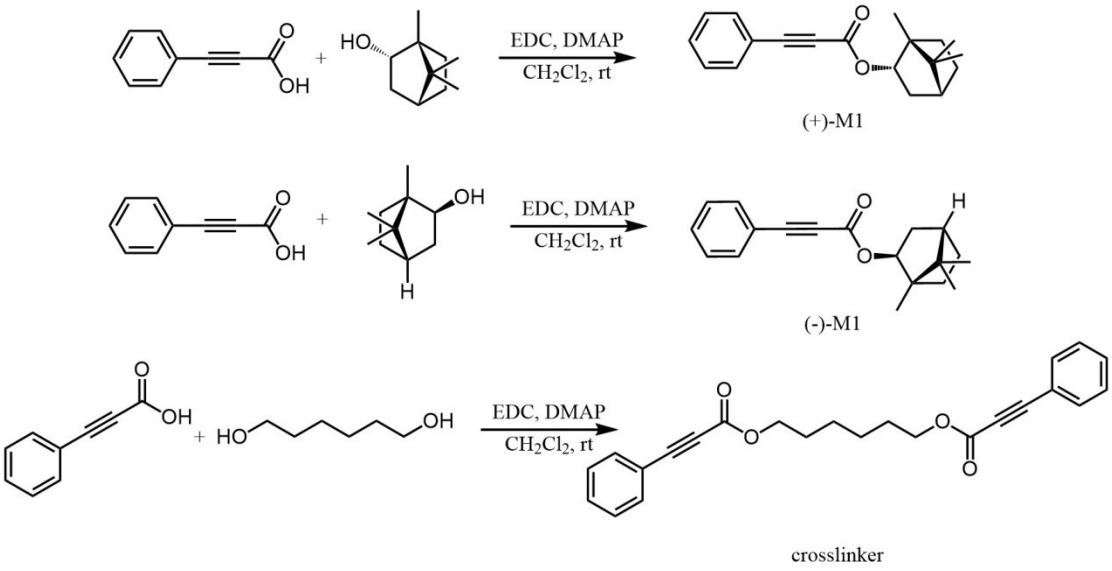

Figure S1. The preparation process of (+)-M1, (−)-M1 and crosslinker.

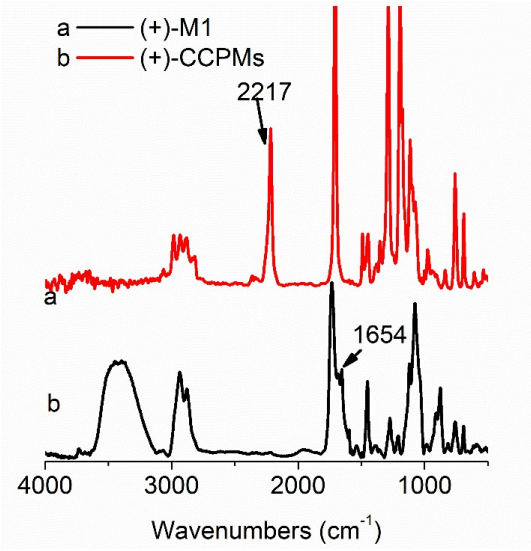

Figure S2. FT-IR spectra of (+)-M1 and (+)-CCPMs (in KBr tablet).

In FT-IR spectrum of (+)-M1 and (+)-CCPMs, 2223 cm^{-1} for (–C≡C); 1702 cm^{-1}, 1290 cm^{-1} and 1189 cm^{-1} for (–CO–O–), 765 cm^{-1} and 690 cm^{-1} for benzene ring.

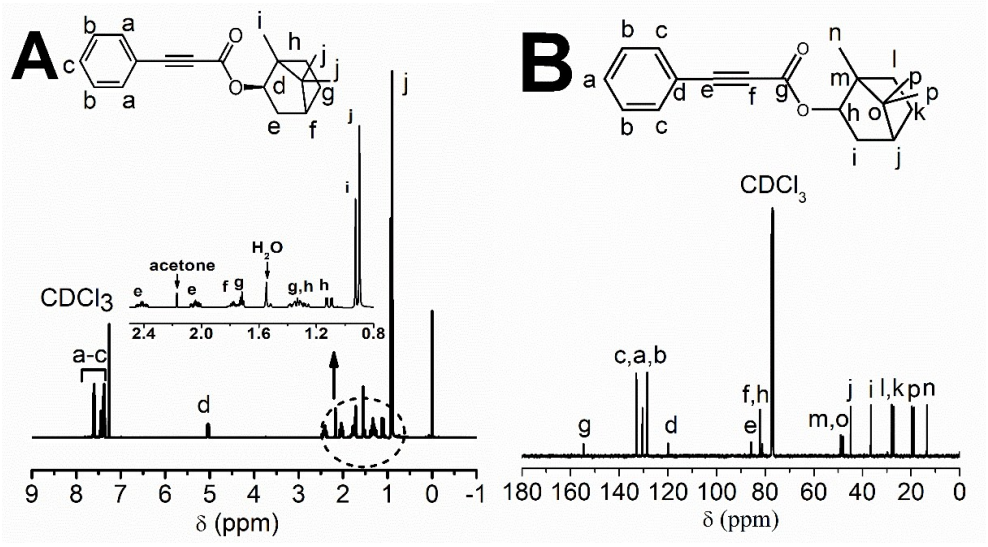

Figure S3. ^{1}H NMR (A) and ^{13}C NMR (B) spectrum of (+)-M1 in $CDCl_3$.

^{1}H NMR (400 MHz, $CDCl_3$): δ ppm, 7.34-7.66 (m, 5H, Ar-H), δ 5.04 (t, 1H, CH), δ 2.0-2.4 (m, 2H, CH2), δ 1.78 (t, 1H, CH), δ 1.35-1.72 (m, 2H, CH2), δ 1.09-1.28 (m, 2H, CH2), δ 0.93 (s, 3H, CH3), δ 0.90 (s, 6H, CH3).

^{13}C NMR (100 MHz, $CDCl_3$): δ ppm, 154.8, 133.2, 130.1, 128.2, 119.5, 85.7, 82.2, 80.8, 48.9, 47.5, 44.5, 36.2, 27.9. 27.4, 19.6, 13.2.

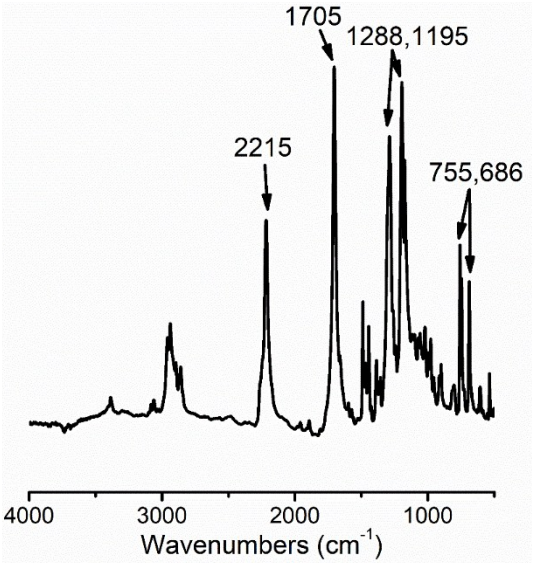

Figure S4. FT-IR spectrum of the crosslinker (in KBr tablet).

In FT-IR spectrum of the cross-linker, 2223 cm^{-1} for (–C≡C); 1702 cm^{-1}, 1290 cm^{-1} and 1189 cm^{-1} for (–CO–O–), 765 cm^{-1} and 690 cm^{-1} for benzene ring.

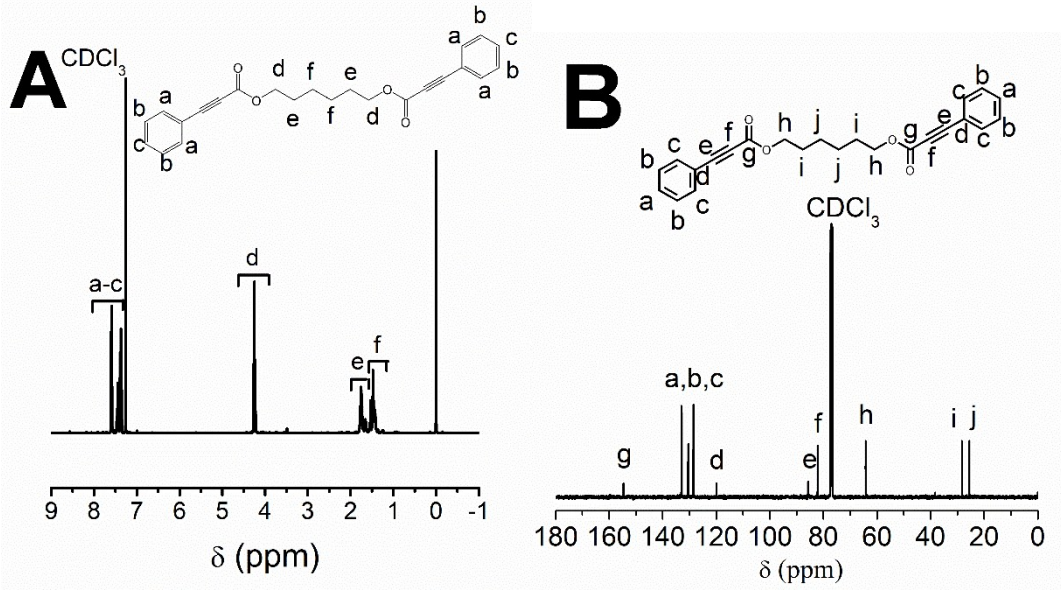

Figure S5. ^{1}H NMR spectrum of crosslinker in $CDCl_3$.

^{1}H NMR (400 MHz, $CDCl_3$): δ ppm, 7.33-7.66 (m, 10H, Ar-H), δ 4.24 (t, 4H, CH_2), δ 1.64-1.78 (t, 4H, CH_2), δ 1.43-1.54 (t, 4H, CH_2).

^{13}C NMR (100 MHz, $CDCl_3$): δ ppm, 154.7, 133.1, 130.2, 128.3, 119.6, 85.7, 82.2, 64.1, 28.4, 25.5.

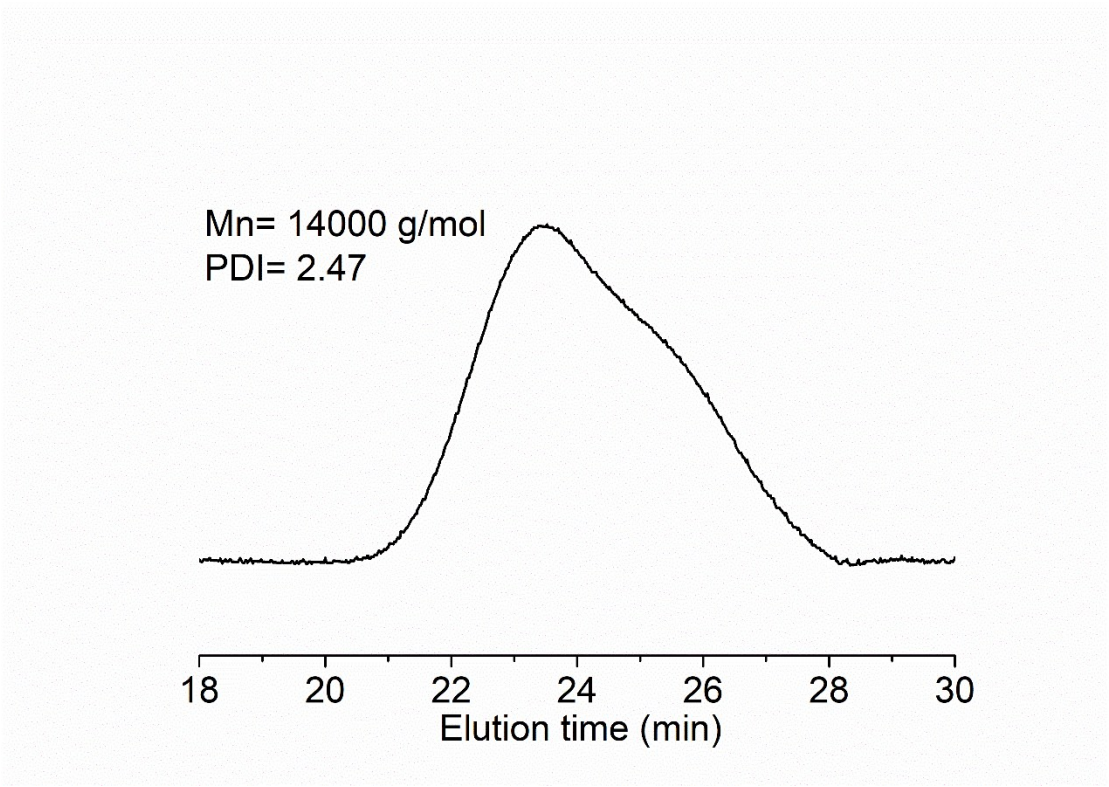

Figure S6. GPC chromatogram of (+)-P1 calibrated with polystyrenes, using DMF as eluent, at room temperature, polymer concentration 1 mg/ml.

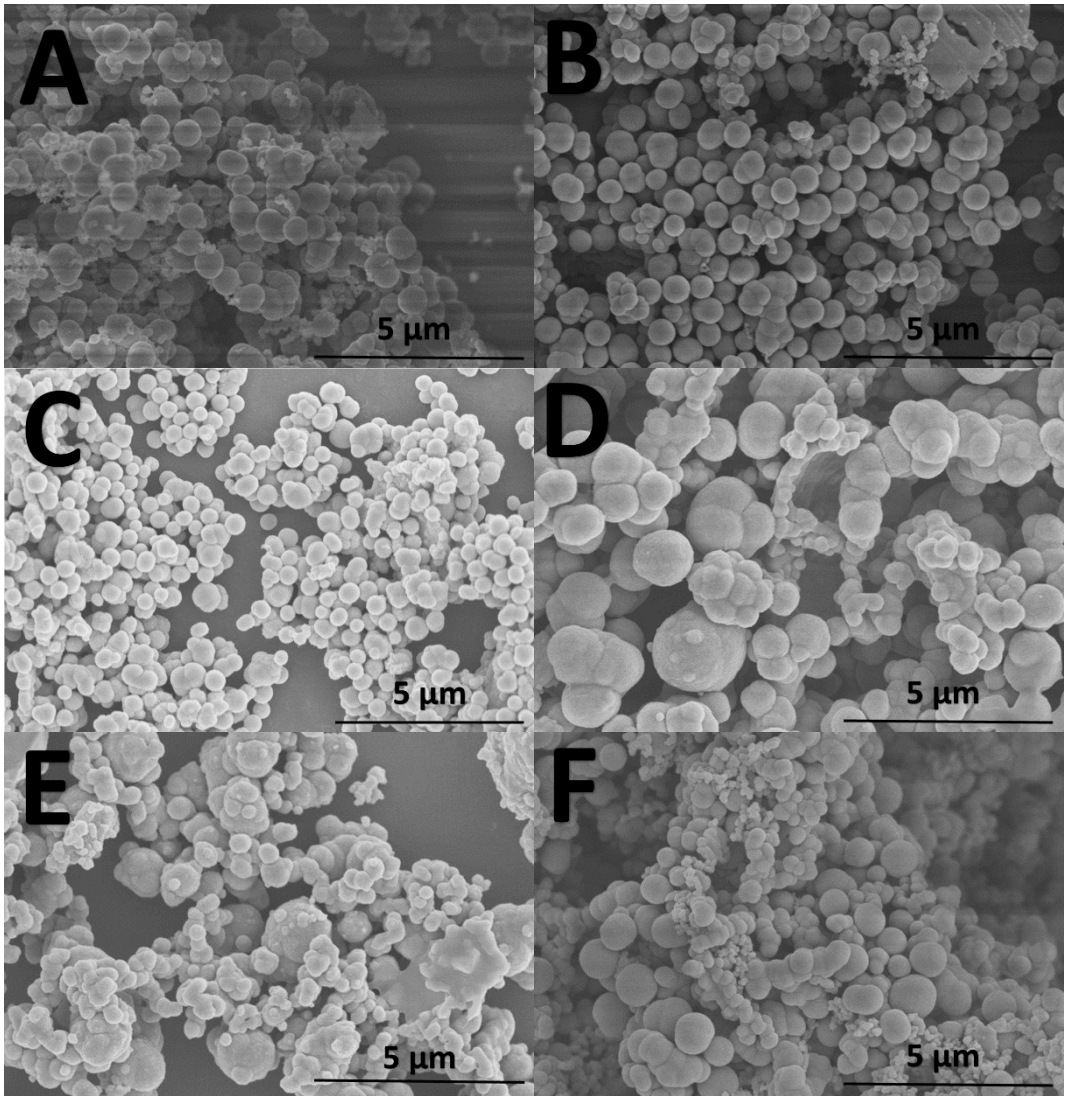

Figure S7. SEM images of (+)-CCPMs prepared in dioxane/ butyl acetate solvent mixture with varied ratio: A, 1/9; B, 2/8; C, 3/7; D, 4/6; E, 5/5; F, 6/4; (v/v) WCl_6, 10 mg; Ph_4Sn, 10.7, mg; (+)-M1 amount, 50 mg; crosslinker amount, 10 mg; polymerization at 80 ^oC for 24 h.

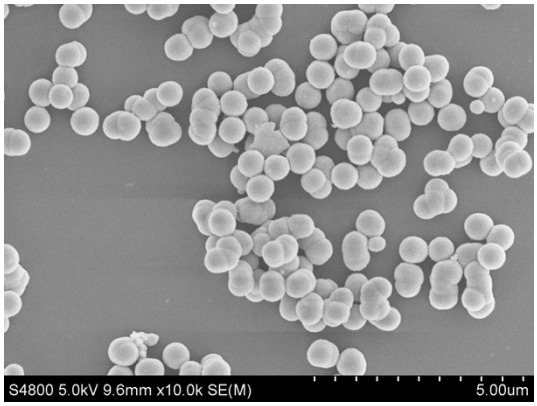

Figure S8. SEM image of polymer particles prepared with (+)-M1 in the absence of crosslinker; (+)-M1 50 mg, dioxane/DMF = 9.85/0.15 (v/v), WCl_6/Ph_4Sn = 10/10.7 in mg.

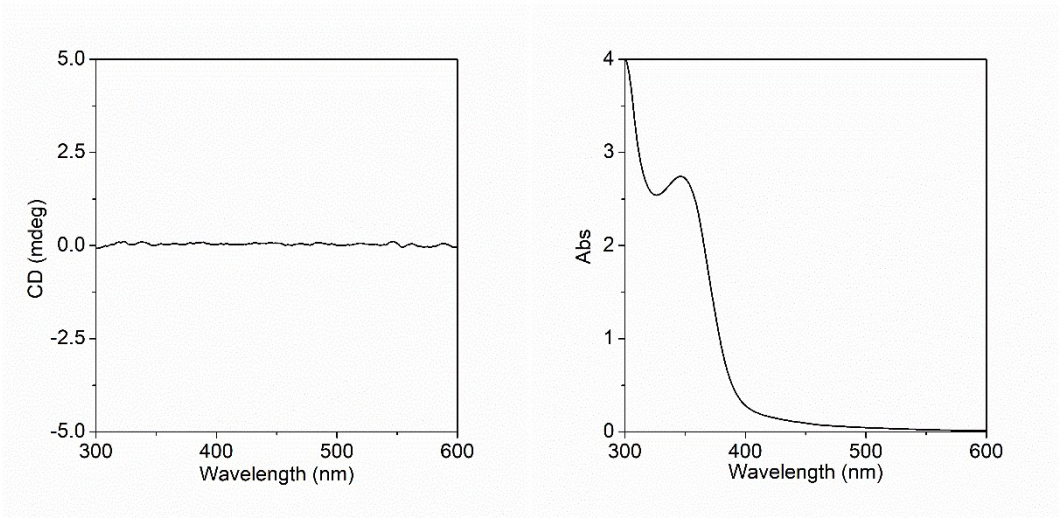

Figure S9. CD and UV-vis absorption spectra of (+)- and (-)-CCPMs mixture with equal amount, measured by dispersing microspheres in dioxane solvent.

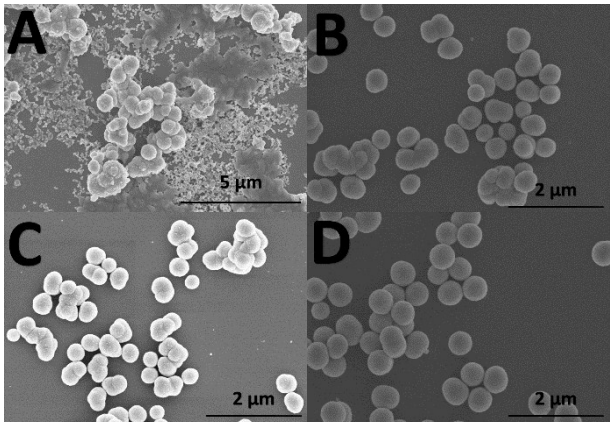

Figure S10. SEM images of NPs prepared by WCl_6-Ph_4Sn with different amount: A, 10/11; B, 20/21.5; C, 30/33; D, 40/43 in mg. (dioxane/butyl acetate, 2/8, v/v; (+)-M1 amount, 0.14 ml; polymerization at 80 ^{o}C for 24 h)

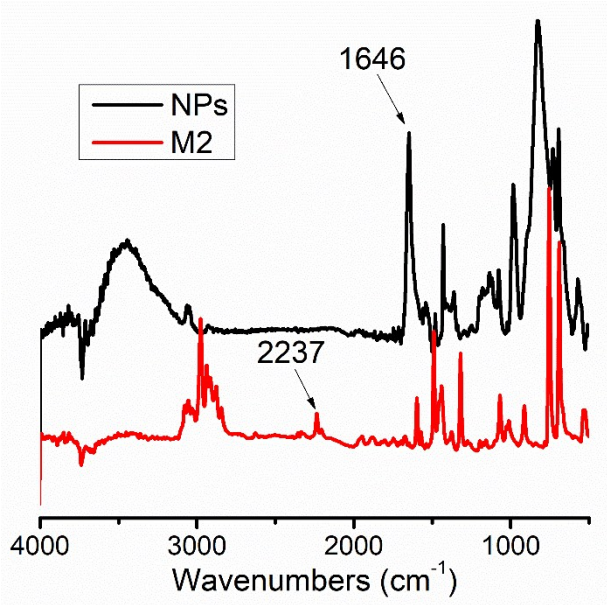

Figure S11. FT-IR spectrum of M2 and corresponding NPs (with KBr as tablet).

In FT-IR spectrum of M2 and NPs, 2237 cm^{-1} for (–C≡C); 1646 $cm^{-1}$for (C=C).

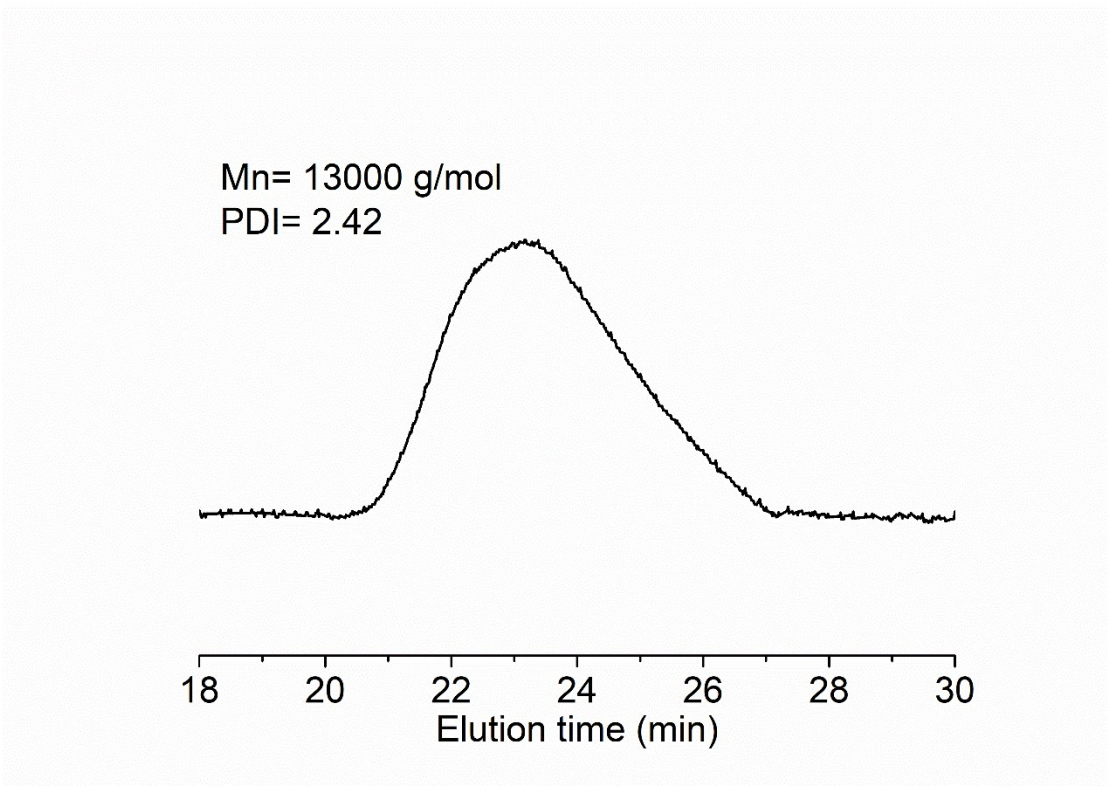

Figure S12. GPC chromatogram of P2 calibrated with polystyrenes, using DMF as eluent, at room temperature, polymer concentration 1mg/ml.

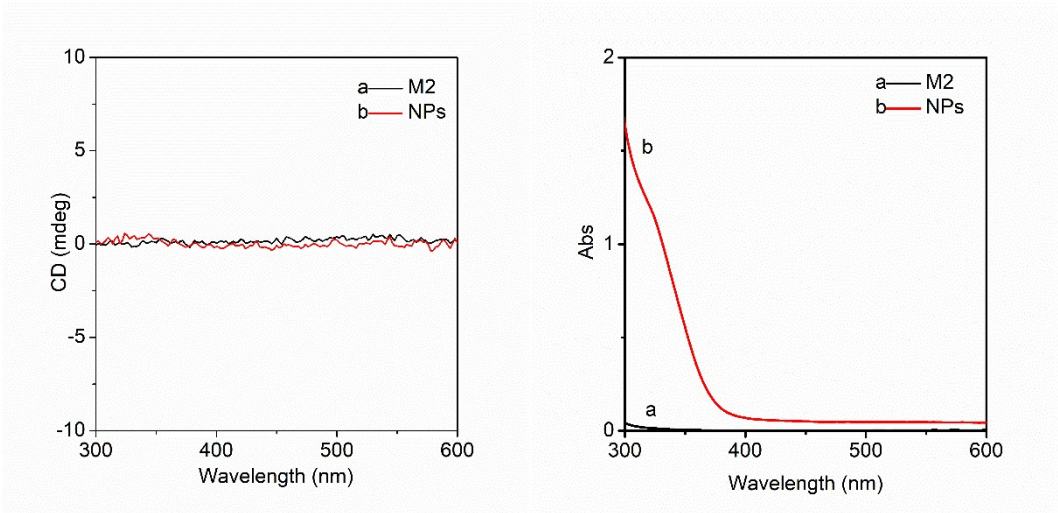

Figure S13. CD and UV-vis absorption spectra of M2 and P2, measured by dissolving M2 and P2 in DMF solvent (c= 10^{-4} M, by monomer units).