Supporting Information For:

Polypentenamer thermoplastic elastomers via copolymerization of cyclopentene and dicyclopentadiene

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Keywords: polypentenamer, cyclopentene, dicyclopentadiene, copolymer, thermoplastic elastomer

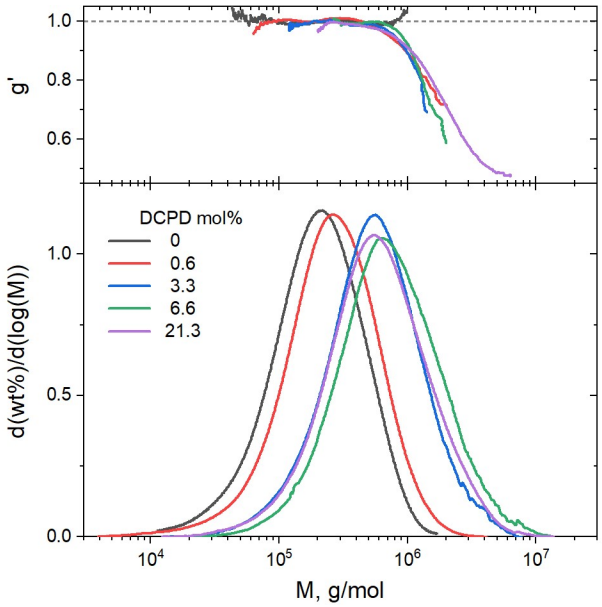

Figure S1: GPC data for the calculation of branching index (top) and molecular weight density (bottom) versus molecular weight (M) for polymers of varying DCPD content.

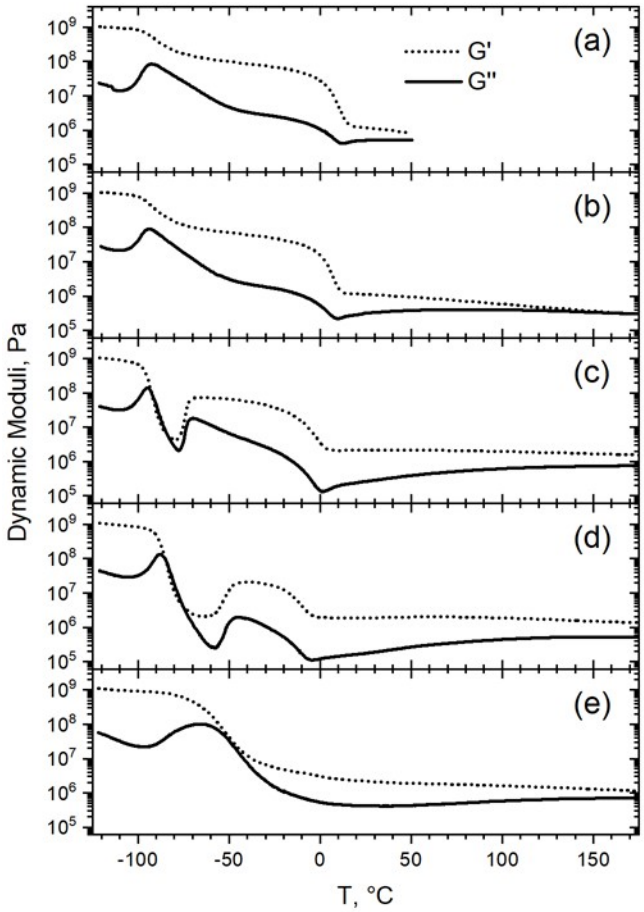

Figure S2: DMTA data showing storage and loss modulus at a heating ramp of 2 °C/min after fast quenching (60 °C/min). Figure (a)~(e) represent the samples with DCPD mol% from 0,0.6,3.3,6.6 and 21.3% respectively.

0% DCPD (-40 C)
28.4% crystallinity

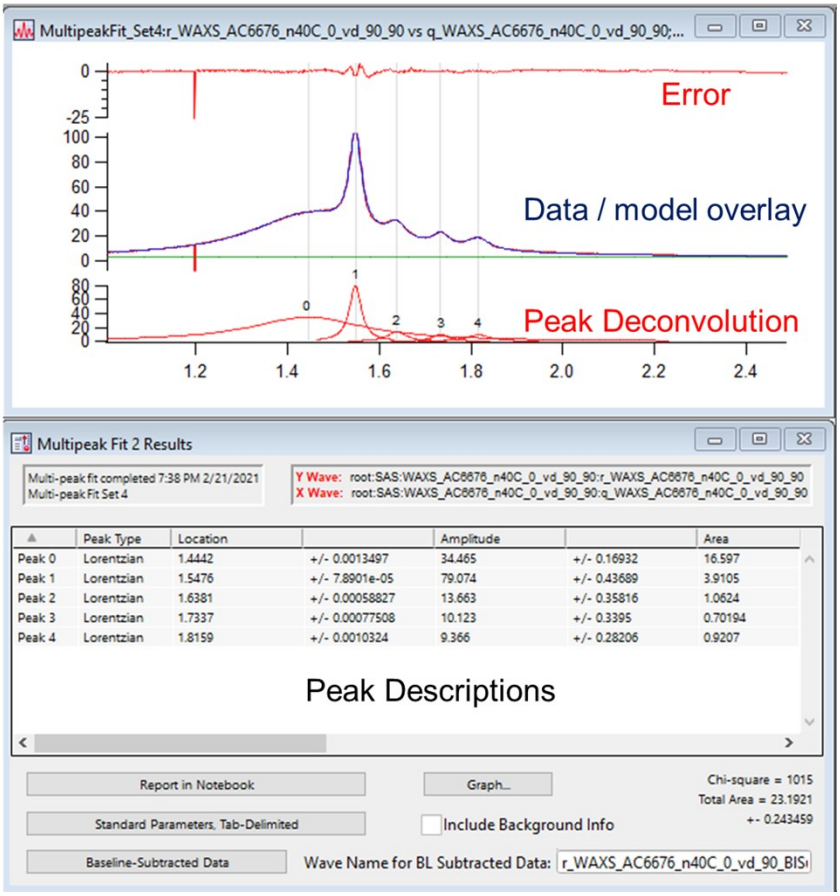

Figure S3: Example of Igor curve fitting software. (Top) Peak fitting results. Raw data neatly described as the combination of 1 amorphous peak (peak 0) and 4 crystalline peaks (peaks 1-4). (bottom) Peak descriptions used to calculate % crystallinity using following equation.

$$\%\ Crystallinity = 100\ \times \frac{\sum Peak\ areas\ 1,2,3,4}{\sum Peak\ area\ 0,1,2,3,4}$$

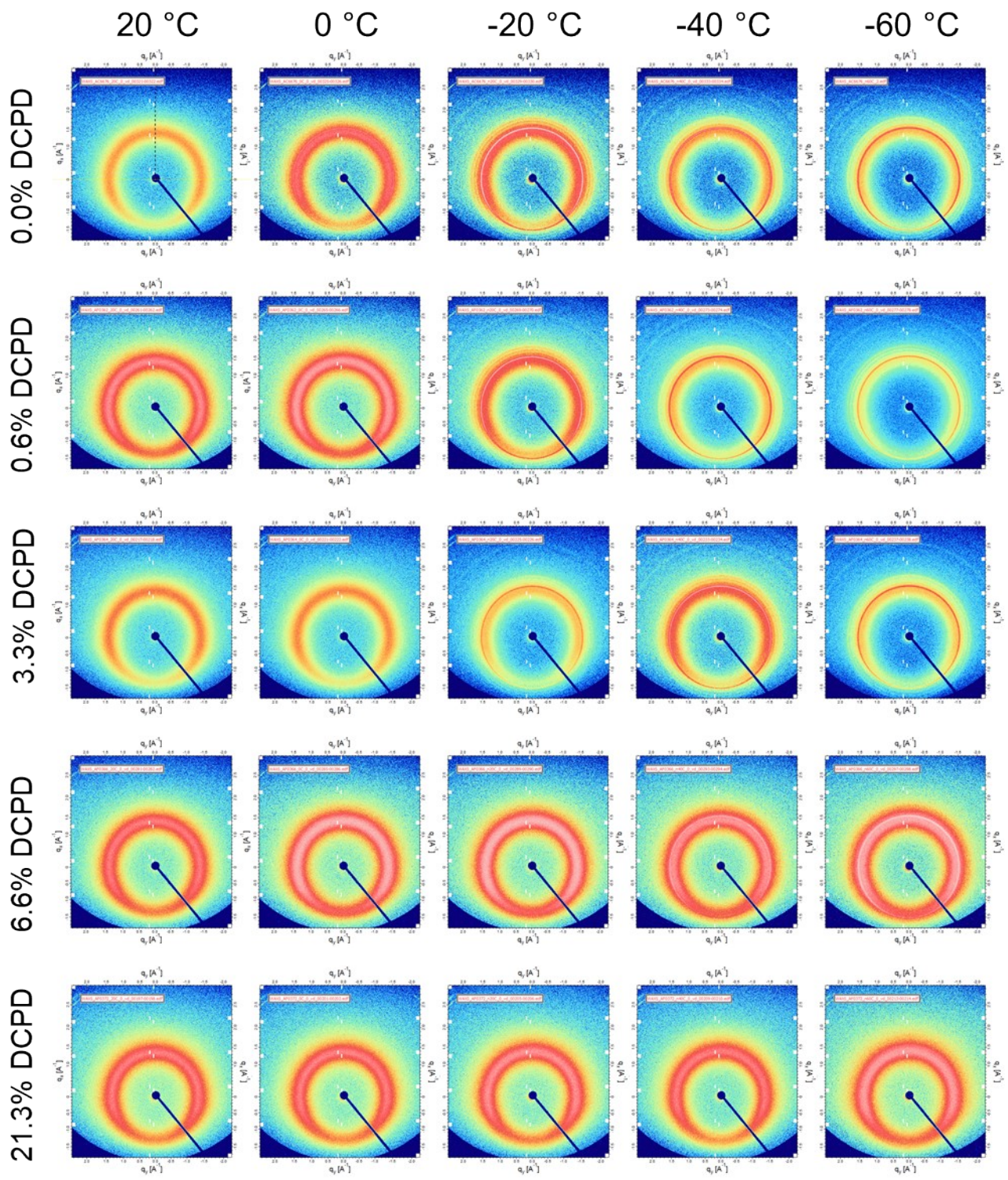

Figure S4: WAXS 2D images. Circular integration for 1D plots performed on the top half of data between 0 and 180 degrees to avoid the shadowing effect that reduced scattering intensity towards the bottom of the detector.

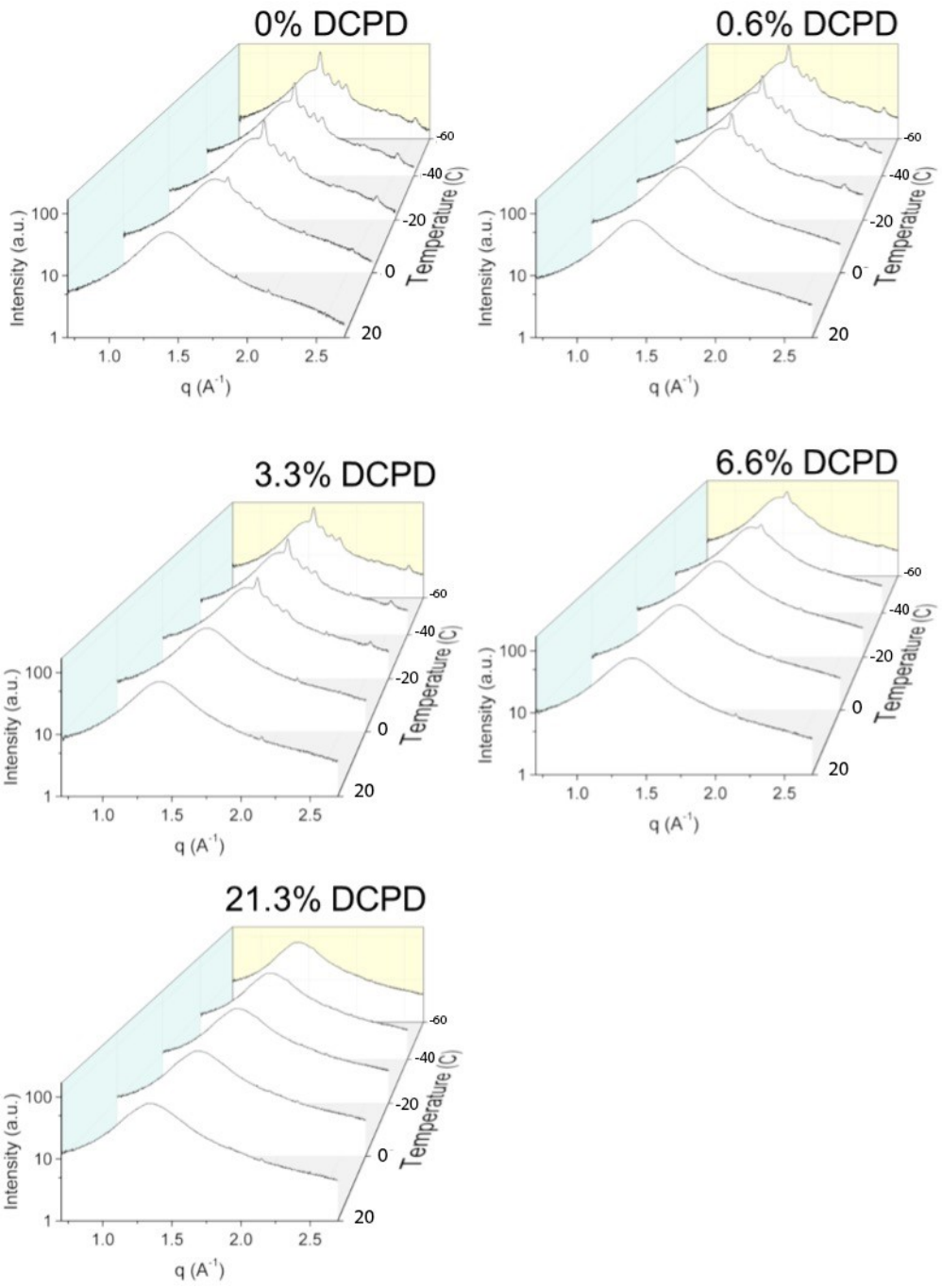

Figure S5: WAXS 1D Waterfall Plots for the polypentenamer with different DCPD content.

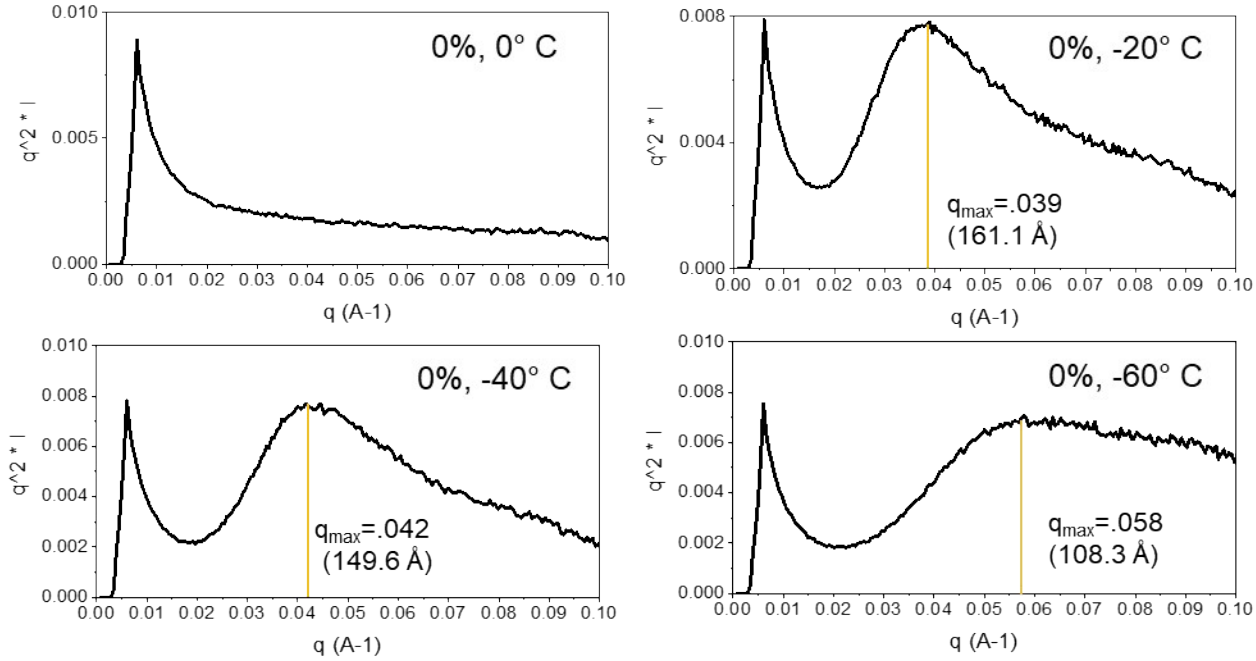

Figure S6: Kratkey plots of polypentenamer containing 0% DCPD at various temperatures.

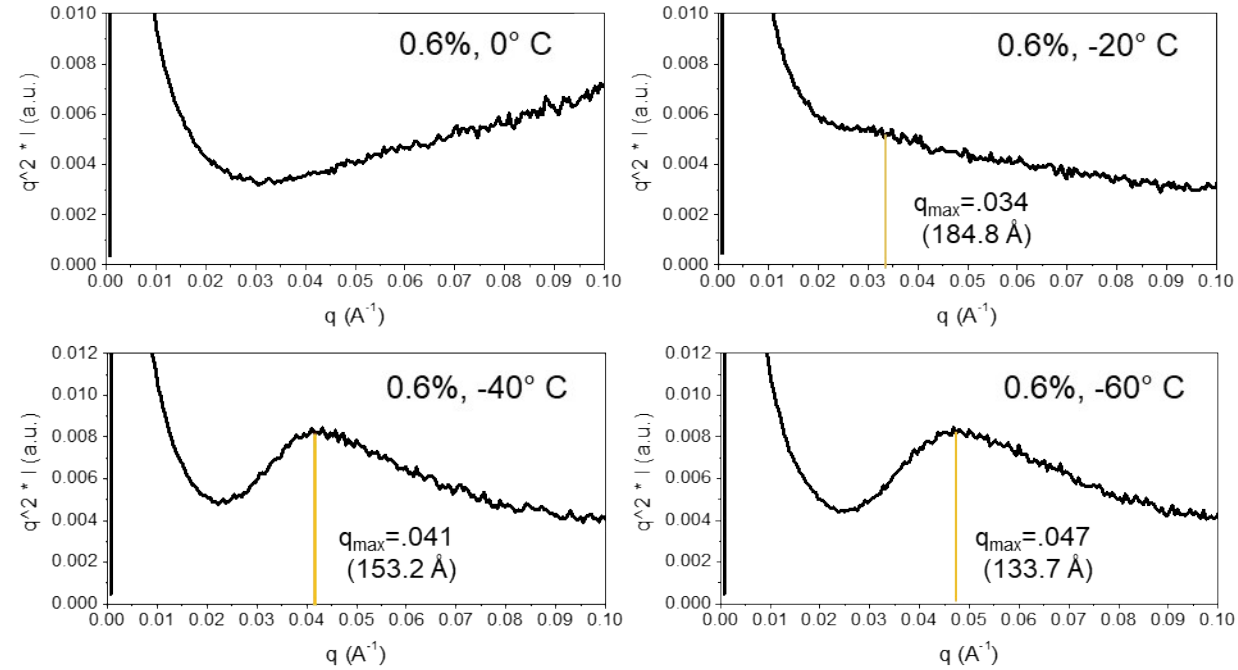

Figure S7: Kratkey plots of polypentenamer containing 0.6% DCPD at various temperatures.

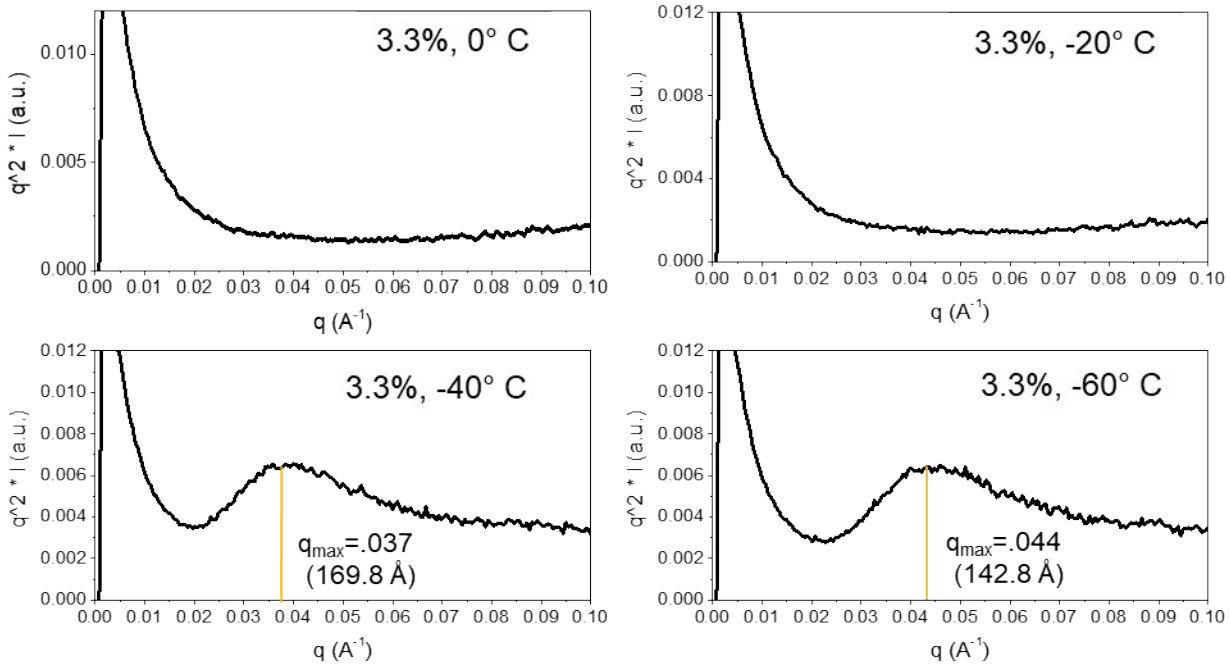

Figure S8: Kratkey plots of polypentenamer containing 3.3% DCPD at various temperatures.

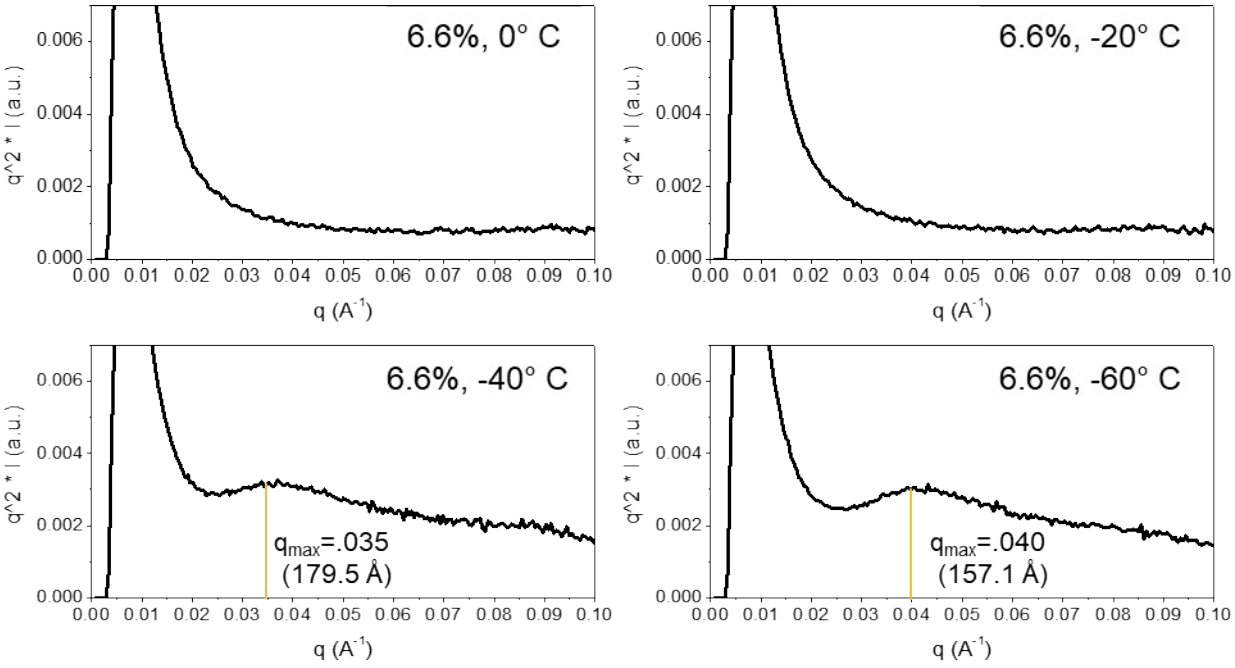

Figure S9: Kratkey plots of polypentenamer containing 6.6% DCPD at various temperatures.

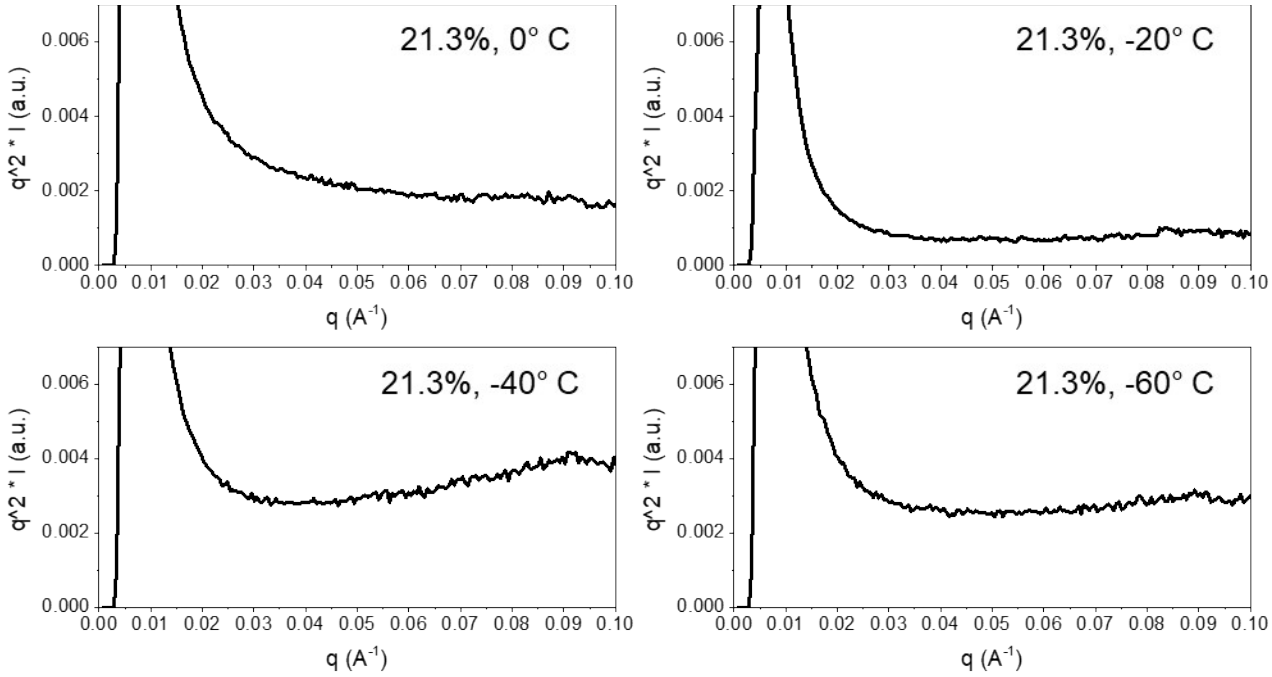

Figure S10: Kratkey plots of polypentenamer containing 21.3% DCPD at various temperatures.

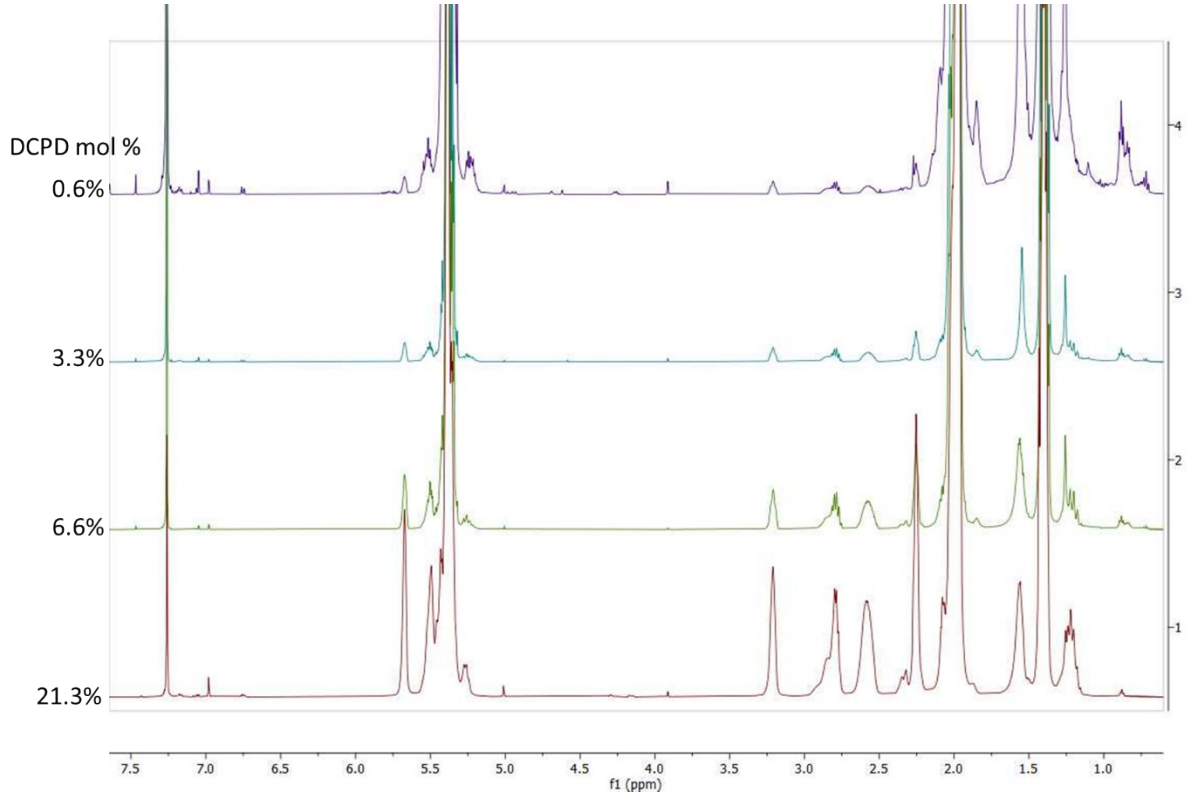

Figure S11: ^{1}H NMR spectra for polypentenamer samples containing DCPD (in $CDCl_3$, 25 °C).

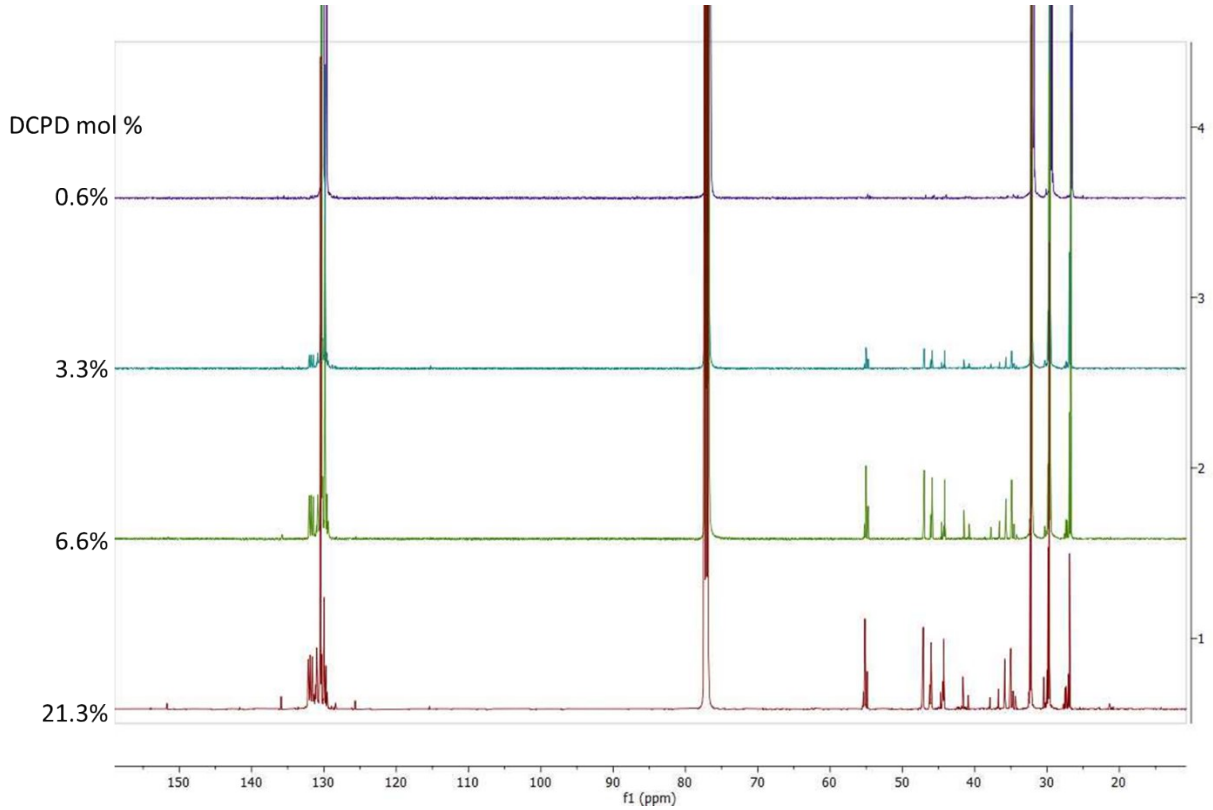

Figure S12: ^{13}C NMR spectra for polypentenamer samples containing DCPD (in $CDCl_3$, 25 ^oC).

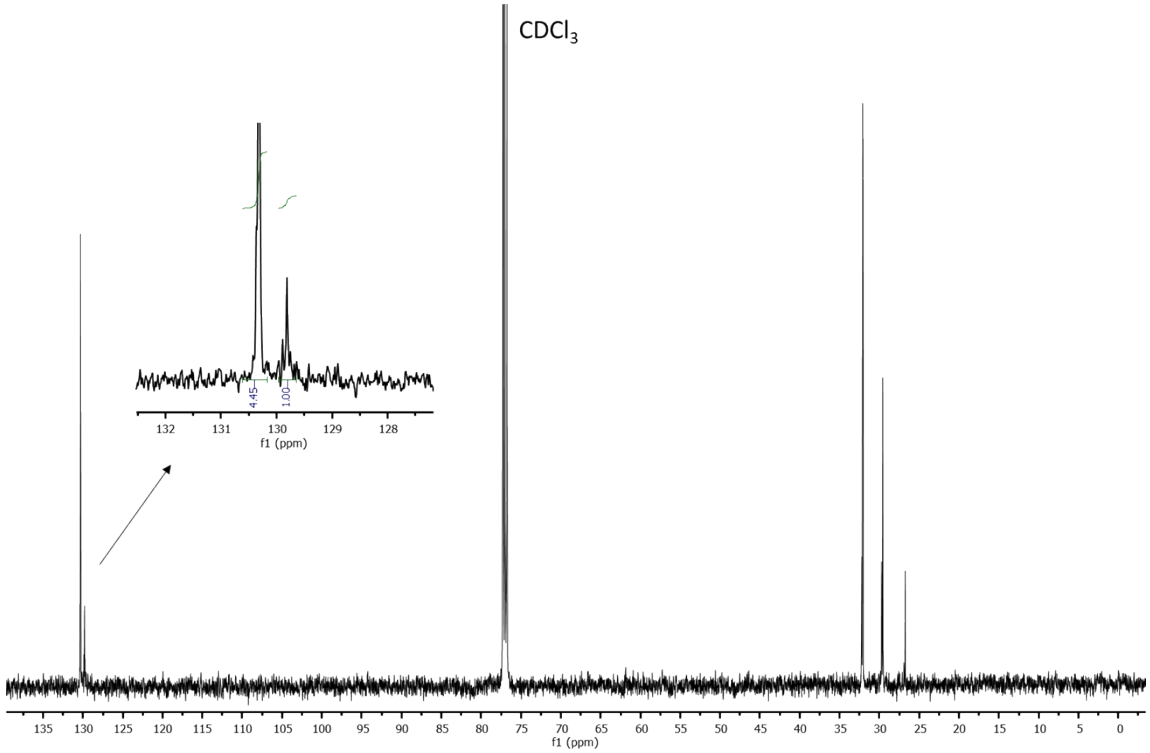

Figure S13: ^{13}C NMR spectra for polypentenamer homopolymer (in $CDCl_3$, 25 ^oC).