Supporting Information

Molecular Dynamics of Polyfarnesene

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1. Rheology

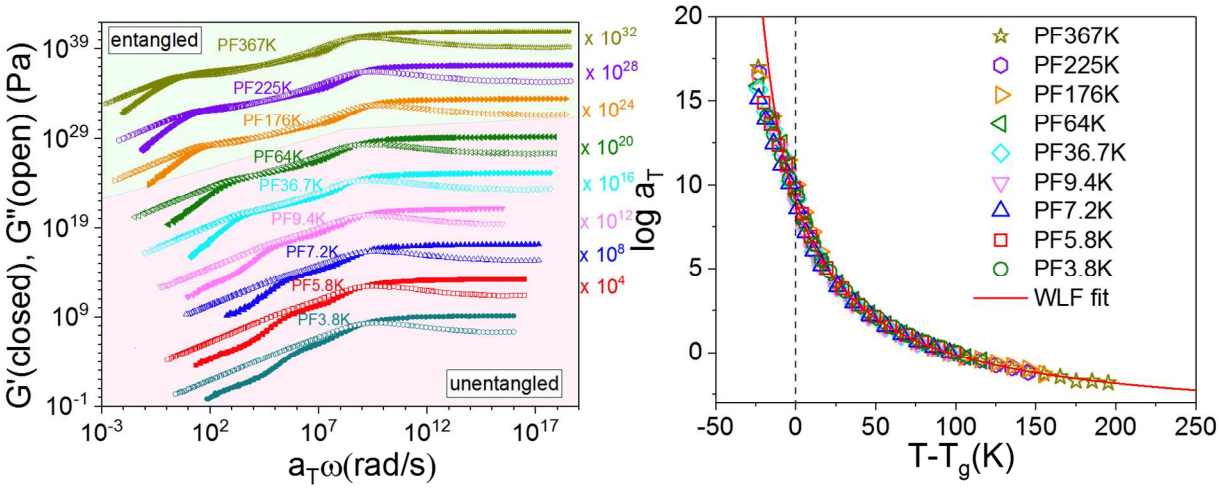

Figure S.1: (a) Dynamic master curves of storage and loss moduli for all PF samples from the terminal region to the glassy state at a reference temperature of T_{ref} = 293K. Curves are shifted using the indicated vertical scale factors. The entangled and unentangled polymers are also indicated by different color shading. (b) Frequency shift factors (a_T) used to generate the master curves as a function of T - T_g. The frequency shift factors are well fitted by the WLF equation, as indicated.

2. Dielectric spectroscopy

Table S1. VFT fitting parameters for the dielectric α relaxations and T_g BDS

Sample ID	ω_∞	B	$T_0 \pm 2$ K	$T_{g\,BDS}$ (K)
PF3.8K	1.3E10	3.34	172	192
PF5.8K	1.49E10	3.47	172	194
PF7.2K	1.84E10	3.53	173	195
PF9.4K	2.1E9	2.3	182	198
PF36.7K	1.4E10	3.4	175	196
PF64K	5.2E13	10.6	150	195
PF176K	9.7E12	8.7	156	196
PF225K	6.6E10	4.2	173	198
PF367K	1.25e10	3.4	177	200

3. Density

The densities, ρ, for all PF samples were determined at room temperature using a high-precision helium pycnometer (AccuPyc II 1340, Micrometrics Instrument. Corporation). The sample chamber was calibrated with different density standards before running each measurement. Prior to measurement, all samples were carefully dried and purged in order to

avoid the influence of moisture and adsorbed impurities. The reported values of density represent an average of ten consecutive measurements with a standard deviation less than 0.0003 g/ cm^3.

Table S2: Weight average molecular weights and densities for PF under study.

Sample	M_w (g/mol)	Density (g/cm^3)	Density deviation (g/cm^3)
PF3.8K	3,800	0.8920	0.0001
PF5.8K	5,800	0.8952	0.0002
PF7.2K	7,200	0.8940	0.0002
PF9.4K	9,400	0.8963	0.0002
PF36.7K	36,700	0.8977	0.0001
PF64K	64,000	0.9018	0.0002
PF176K	176,200	0.9019	0.0001
PF225K	225,400	0.9021	0.0002
PF367K	367,100	0.9020	0.0003