Support Information (SI)

Modeling elongational viscosity and brittle fracture of 10 polystyrene Pom-Poms by the Hierarchical Molecular Stress Function model

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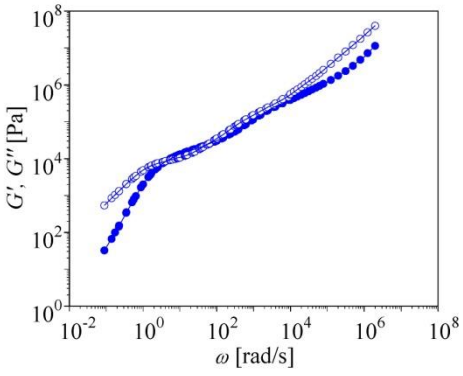
1. Linear-viscoelastic Characterization

Storage modulus *G'* (full symbols), loss modulus *G''* (open symbols), loss tangent δ at the reference temperature 160°C:



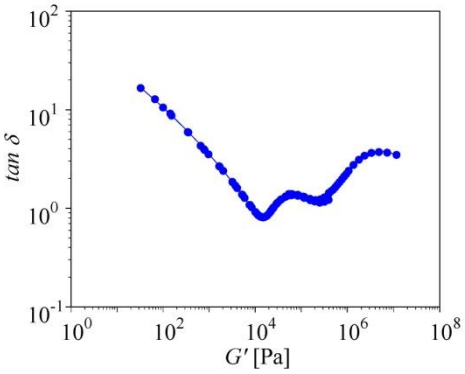


Figure SI.1: 100k-2x11-9k

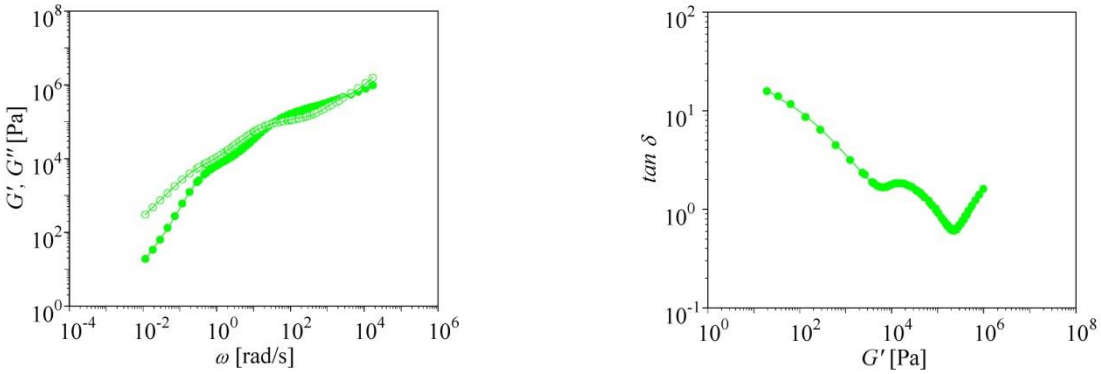


Figure SI.2: 100k-2x12-24k

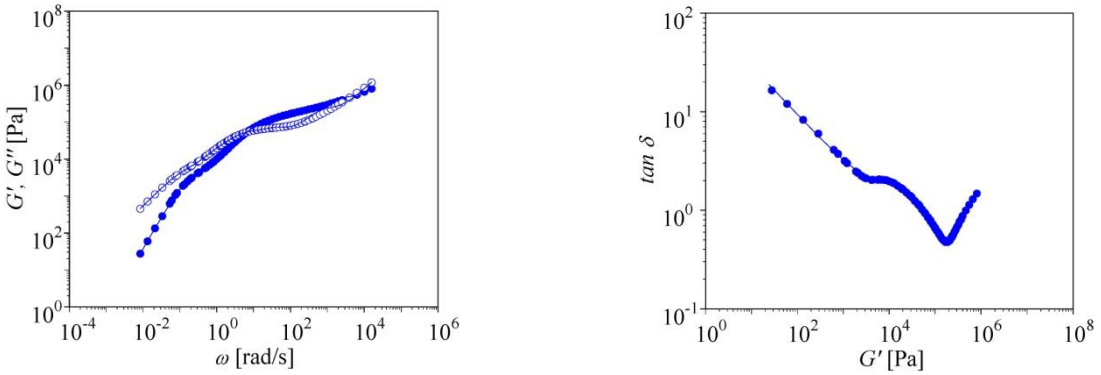


Figure SI.3: 100k-2x12-40k

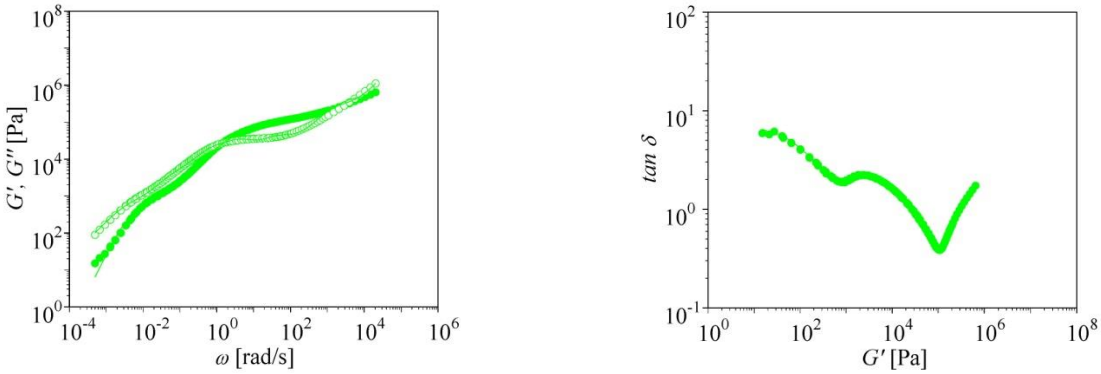
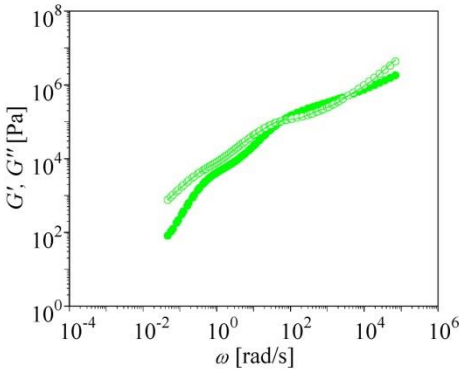


Figure SI.4: 100k-2x14-50k



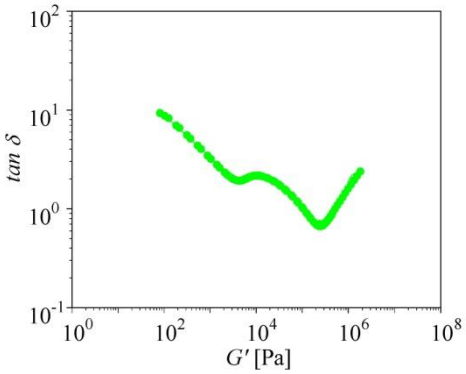
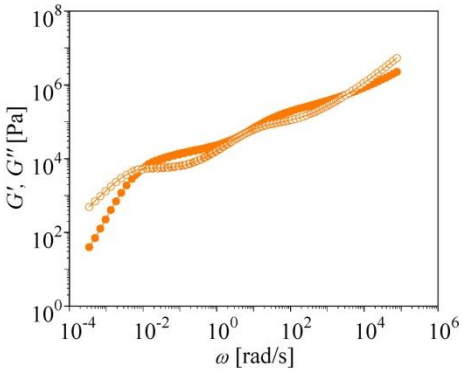


Figure SI.5: 100k-2x22-25k



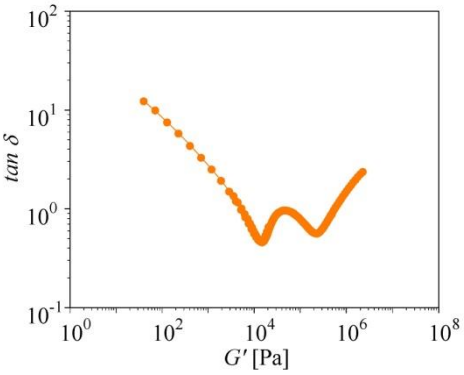
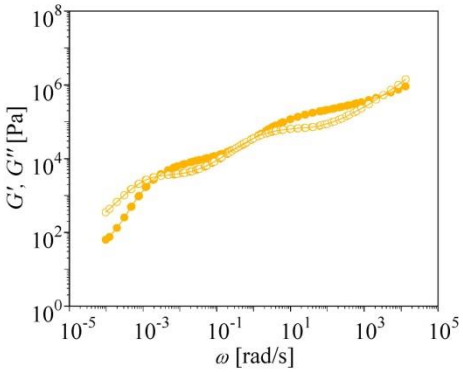


Figure SI.6: 220k-2x9-25k



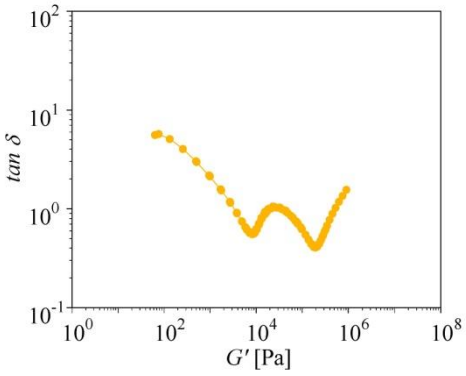


Figure SI.7: 220k-2x10-40k

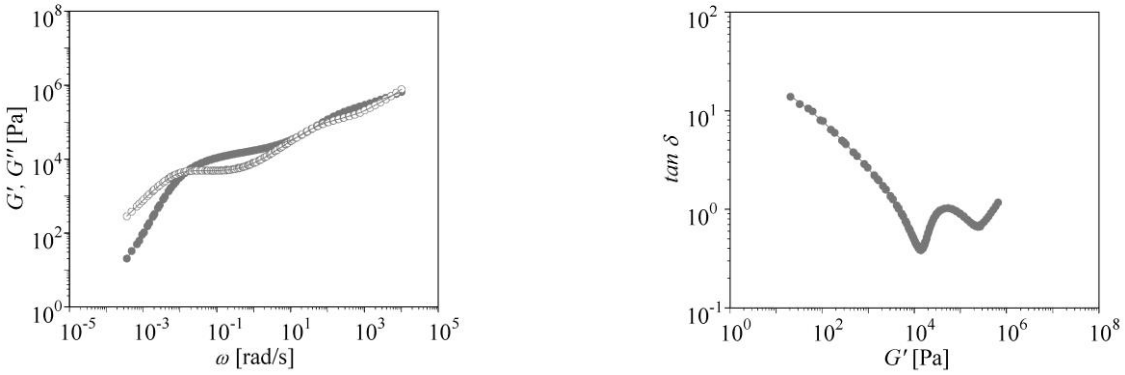


Figure SI.8: 280k-2x22-22k

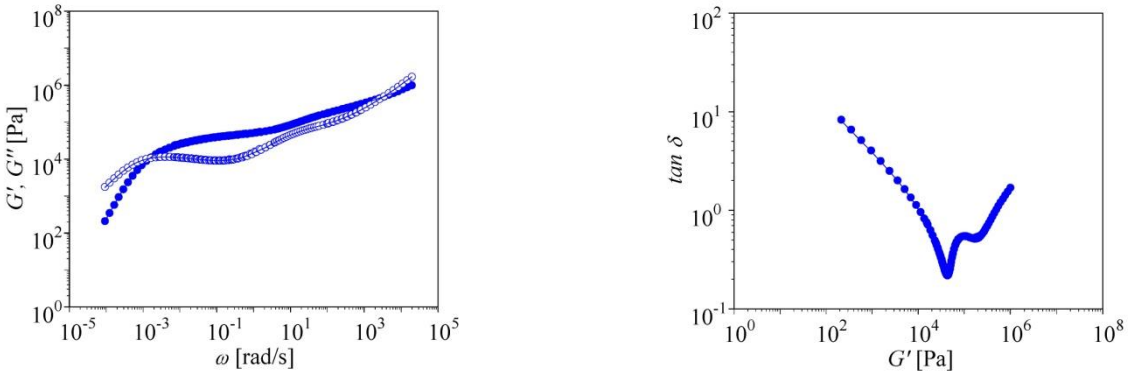


Figure SI.9: 400k-2x9-23k

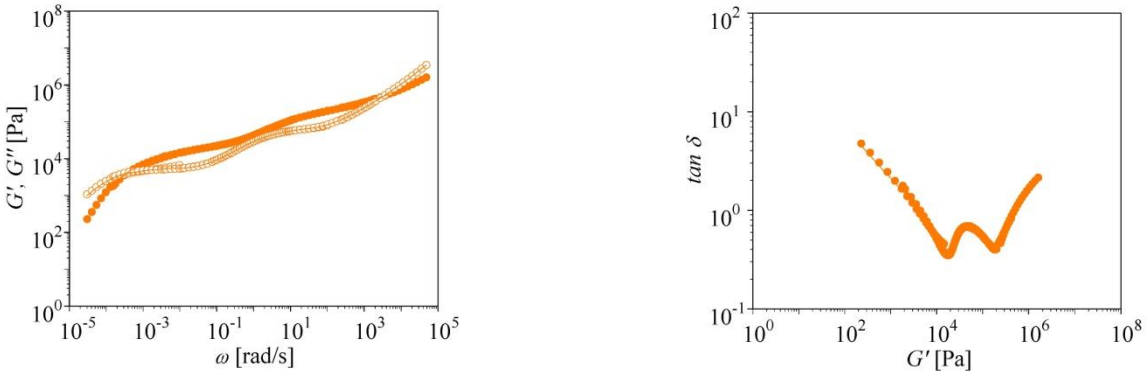


Figure SI.10:400k-2x13-40k

2. Shift factors

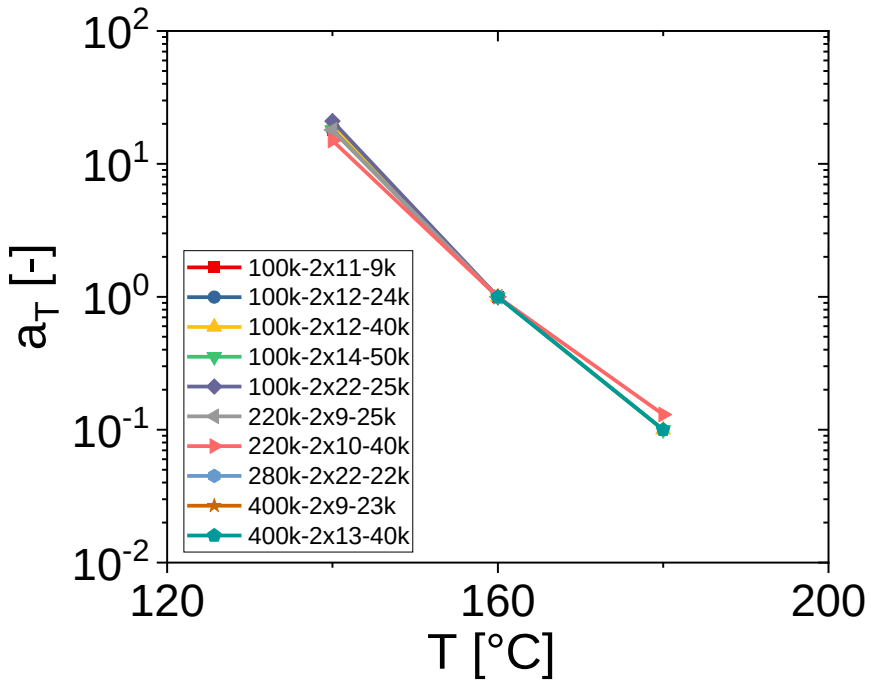


Figure SI.11: Shift factors of the pom-poms

3. Relaxation spectra at the reference temperature 160°C

Table SI.1a

100k-2x11-9k		**100k-2x12-24k**		**100k-2x12-40k**	
g_i [Pa]	τ_i [s]	g_i [Pa]	τ_i [s]	g_i [Pa]	τ_i [s]
2.034e+008	1.050e-007	9.801e+006	8.820e-006		
2.842e+006	2.890e-006	3.917e+005	1.685e-004	4.772e+006	1.697e-005
6.238e+005	3.220e-005	1.588e+005	9.727e-004	3.121e+005	1.117e-003
2.305e+005	3.084e-004	9.294e+004	5.670e-003	8.978e+004	2.709e-002
8.451e+004	1.726e-003	9.519e+004	2.379e-002	6.699e+004	1.618e-001
1.720e+004	1.463e-002	4.405e+004	7.062e-002	1.239e+004	7.703e-001
9.206e+003	1.247e-001	7.336e+003	2.854e-001	3.823e+003	7.584e+000
7.453e+003	5.805e-001	4.445e+003	1.524e+000	6.143e+001	5.679e+001
2.567e+001	1.011e+001	2.727e+003	3.715e+000		
		3.502e+001	3.148e+001		

Table SI.1b

100k-2x14-50k		**100k-2x22-25k**	
g_i [Pa]	τ_i [s]	g_i [Pa]	τ_i [s]
5,674e+006	9,930e-006	1.997e+005	1.613e-003
2,383e+005	2,570e-004	1.882e+007	3.826e-006
7,453e+004	2,351e-003	4.655e+005	1.660e-004
3,967e+004	2,008e-002	1.558e+005	1.726e-002
4,275e+004	1,349e-001	2.382e+004	1.153e-001
3,235e+004	7,386e-001	4.865e+003	1.823e+000
7,125e+003	3,357e+000	1.960e+002	1.063e+001
1,014e+003	2,464e+001		
7,004e+002	1,388e+002		
2,116e+001	2,224e+003		

Table SI.1c

220k-2x9-25k		**220k-2x10-40k**		**280k-2x22-22k**	
g_i [Pa]	τ_i [s]	g_i [Pa]	τ_i [s]	g_i [Pa]	τ_i [s]
3.877e+007	1.766e-006	9.392e+006	1.082e-005	3.589e+006	2.016e-005
9.183e+005	4.118e-005	3.651e+005	2.298e-004	2.501e+005	3.292e-004
3.337e+005	2.382e-004	1.372e+005	1.515e-003	1.173e+005	2.100e-003
1.516e+005	1.282e-003	7.125e+004	9.455e-003	9.994e+004	9.265e-003
9.621e+004	7.073e-003	6.365e+004	5.287e-002	3.809e+004	3.610e-002
8.644e+004	3.302e-002	5.934e+004	2.194e-001	1.060e+004	1.827e-001
4.610e+004	1.197e-001	3.443e+004	8.280e-001	4.493e+003	9.964e-001
1.192e+004	5.936e-001	8.253e+003	4.008e+000	3.927e+003	4.887e+000
5.222e+003	3.357e+000	3.223e+003	2.270e+001	4.229e+003	2.107e+001
4.990e+003	1.697e+001	3.076e+003	1.013e+002	5.204e+003	7.794e+001
5.993e+003	7.966e+001	3.615e+003	4.258e+002	1.321e+003	1.936e+002
3.436e+003	2.367e+002	1.325e+003	1.128e+003	1.722e+001	3.172e+003
2.299e+001	3.178e+003				

Table SI.1d

400k-2x9-23k		**400k-2x13-40k**	
g_i [Pa]	τ_i [s]	g_i [Pa]	τ_i [s]
1.692e+007	4.438e-006	3.597e+007	1.796e-006
4.587e+005	8.190e-005	7.911e+005	3.709e-005
1.996e+005	3.543e-004	3.201e+005	1.876e-004
1.093e+005	1.513e-003	1.419e+005	9.531e-004
7.765e+004	6.991e-003	7.604e+004	5.178e-003
6.289e+004	3.276e-002	5.369e+004	2.806e-002
3.277e+004	1.343e-001	4.797e+004	1.004e-001
1.120e+004	7.990e-001	3.803e+004	3.576e-001
7.346e+003	4.737e+000	1.797e+004	1.277e+000
8.167e+003	2.195e+001	6.632e+003	5.331e+000
1.022e+004	9.186e+001	4.792e+003	2.556e+001
1.183e+004	3.692e+002	5.877e+003	1.403e+002
8.995e+003	1.318e+003	4.794e+003	6.769e+002
3.088e+002	5.558e+003	4.493e+003	3.213e+003
		1.287e+003	1.300e+004