Supplementary Material (ESI) for Soft Matter

Electronic Supplementing Information for

Synthesis and characterization of diblock copolymers of styrene and *N*-tert-butylacrylamide and gelation evidenced by rheology

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Figure S1. GPC chromatograms of polystyrene (S_m with m = 46) and polystyrene-*b*-poly(*N*-tert-butylacrylamide) ($S_{46}NtBAM_n$ with n = 157, 197, 275, 355) with THF as the eluent and calibrated using polystyrene standards.

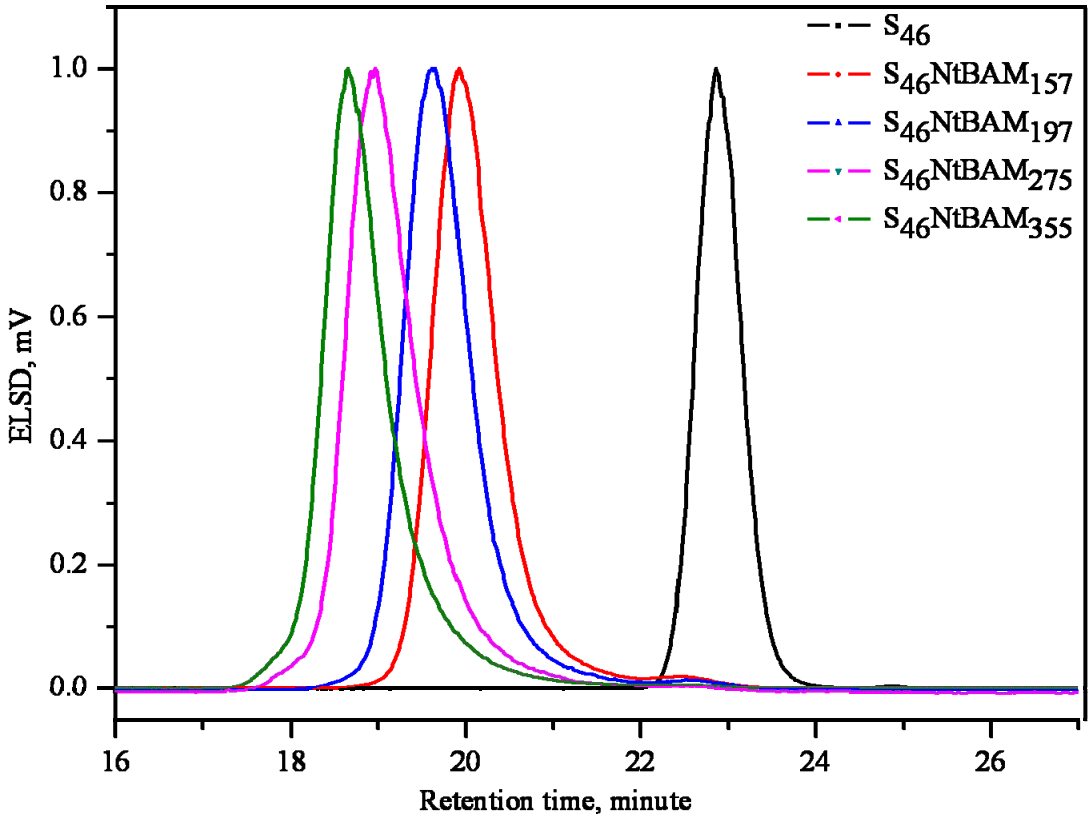
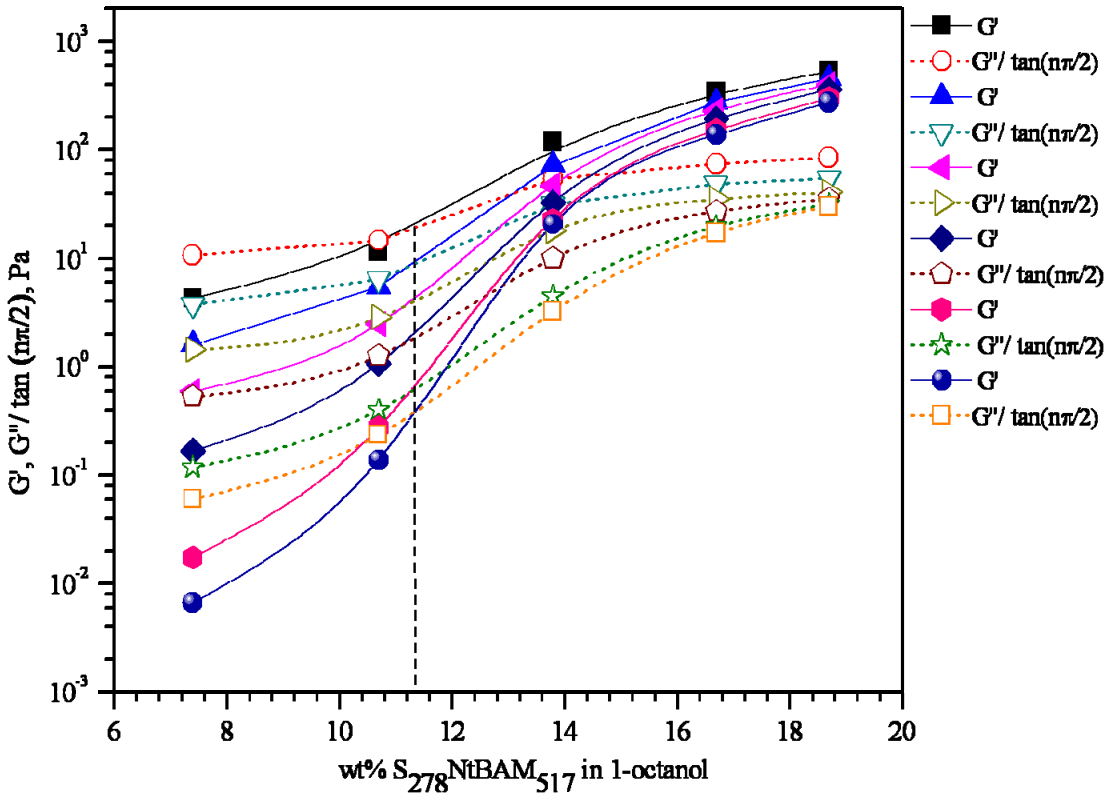


Figure S2. Dynamic rheological data for a system consisting of $S_{278}NtBAM_{517}$/1-octanol. Plot of G' and G"/tan (nπ/2) against concentrations of $S_{278}NtBAM_{517}$ in 1-octanol at various frequencies (99.58, 31.49, 9.958, 3.14, 0.6283 and 0.3149 $rads^{-1}$).

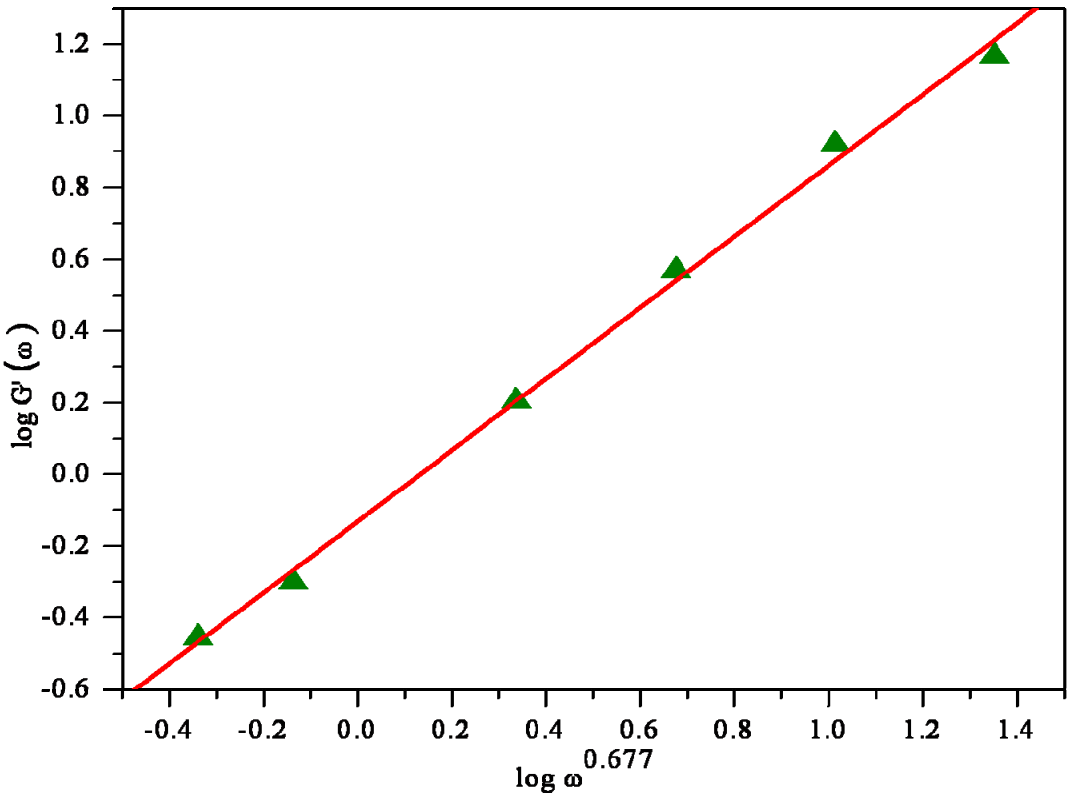


The gel-point equation is as follows:

$$G'(\omega) = \frac{G''(\omega)}{\tan(n\pi/2)} = S\Gamma(1-n)\cos(n\pi/2)\omega^n$$

The above equation suggest the existence of cross-over of G'(ω) and G"(ω)/tan(nπ/2) at the gel point which is manifested in fig. S2. We can obtain the value of G'(ω) from the cross-over point in fig. S2, which is used to calculate front factor, S. The G' obtained for different frequencies are plotted in fig. S3 and S is determined to be 0.55 $Pa\text{-}s^{0.677}$.

Figure S3. Plot of log G' (ω) versus log $\omega^{0.677}$ at critical gelation concentration (c_g = 11.3 wt%) and T = 35 °C of $S_{278}NtBAM_{517}$/1-octanol system.



From the line of fit in fig. S3, we get the intercept = log[SΓ(1-n)Cos(nπ/2)] = - 0.1301. Also we have already calculated the value of viscoelastic exponent, n = 0.677 from fig. 5 in the main paper. Thus the value of S is estimated as 0.55 Pa-$s^{0.677}$.

Note: Γ (1-n) = Γ (1-0.677) = 2.769.