Electronic Supplementary Material (ESI) for Soft Matter.

Electronic Supplementary Information

Rheological and rheo-birefringence features of semidilute ethyl cellulose dispersions under steady shear flow

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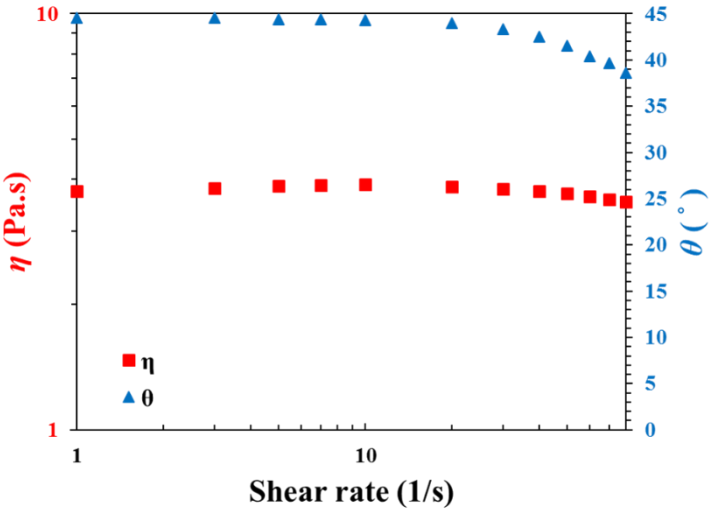

Fig. S1 Steady-state viscosity (η) and orientation angle (θ) as functions of shear rate for a 10 wt% PS/DOP solution measured at room temperature, where the polystyrene (PS) sample bears an average molecular weight of Mw = 280,000 mol/g (Sigma-Aldrich, Inc.).

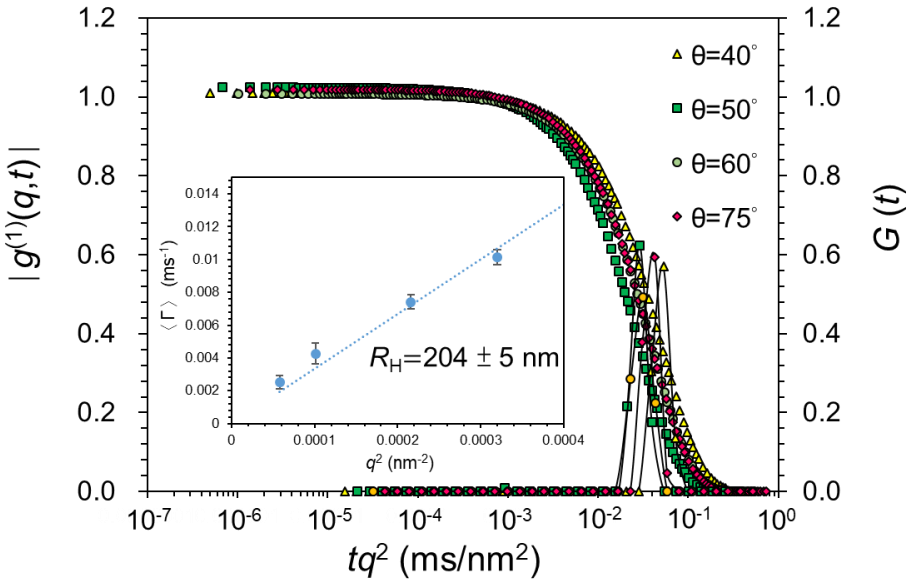

Fig. S2 Dynamic light scattering analysis of a dilute EC dispersion at 1.0 mg/mL and T = 70 °C. The mean hydrodynamic radius shown in the inset, R_H = 204 nm, should be compared with R_H = 286 nm at T = 25 °C reported in prior work (Yi et al., *J. Phys. Chem. B*, 2017, **121**, 638-648.)

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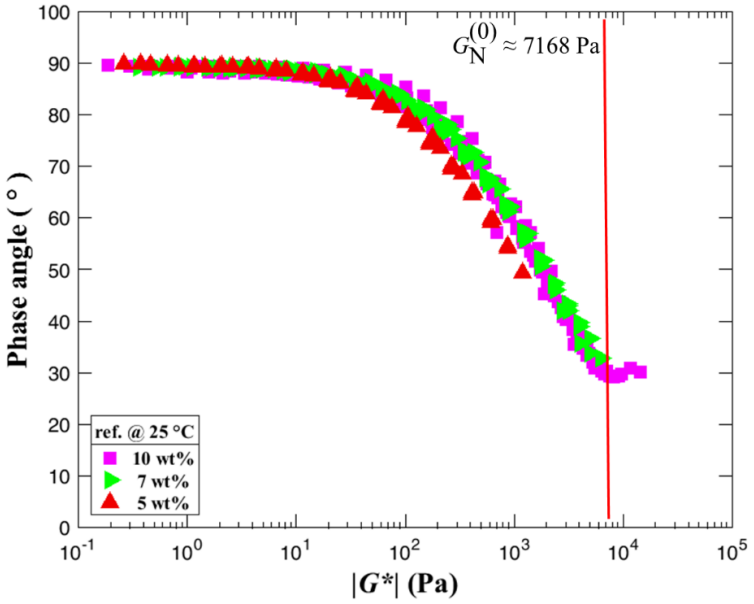

Fig. S3 Van Gurp-Palmen plots for the master curves of several representative EC dispersions shown in Fig. 1b of the main text. The vertical (red) line indicates an approximately constant plateau modulus evaluated from these plots.

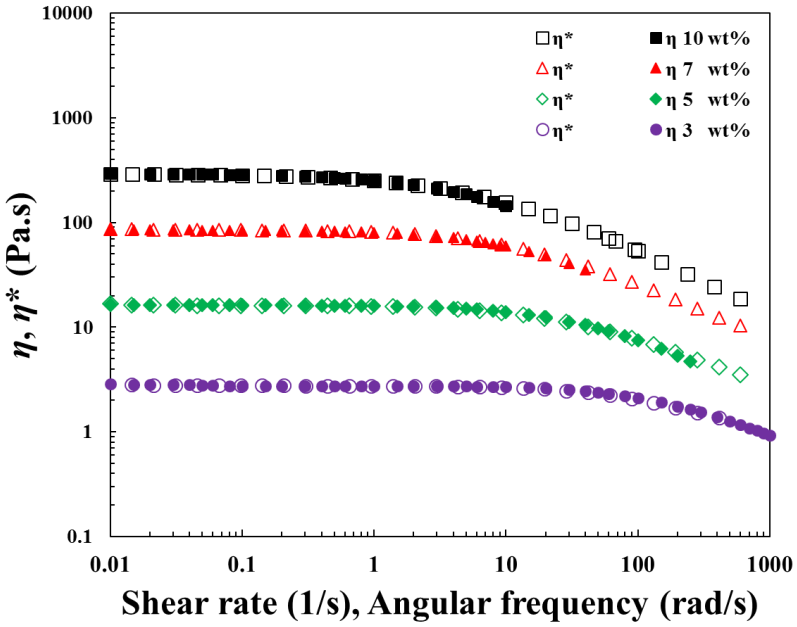

Fig. S4 Evaluation of the Cox-Merz rule for the semidilute EC dispersions investigated in Fig. 1b of the main text.

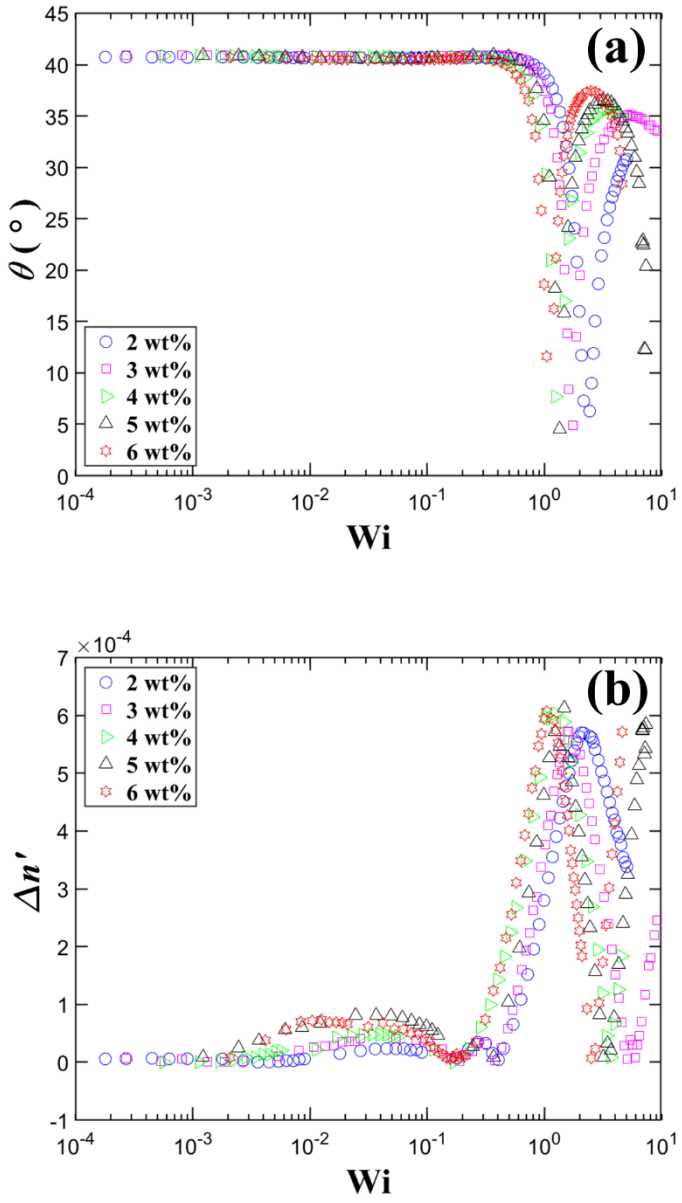

Fig. S5 Steady-state birefringence responses shown in Fig. 4 of the main text are replotted as a function of Weissenberg number.

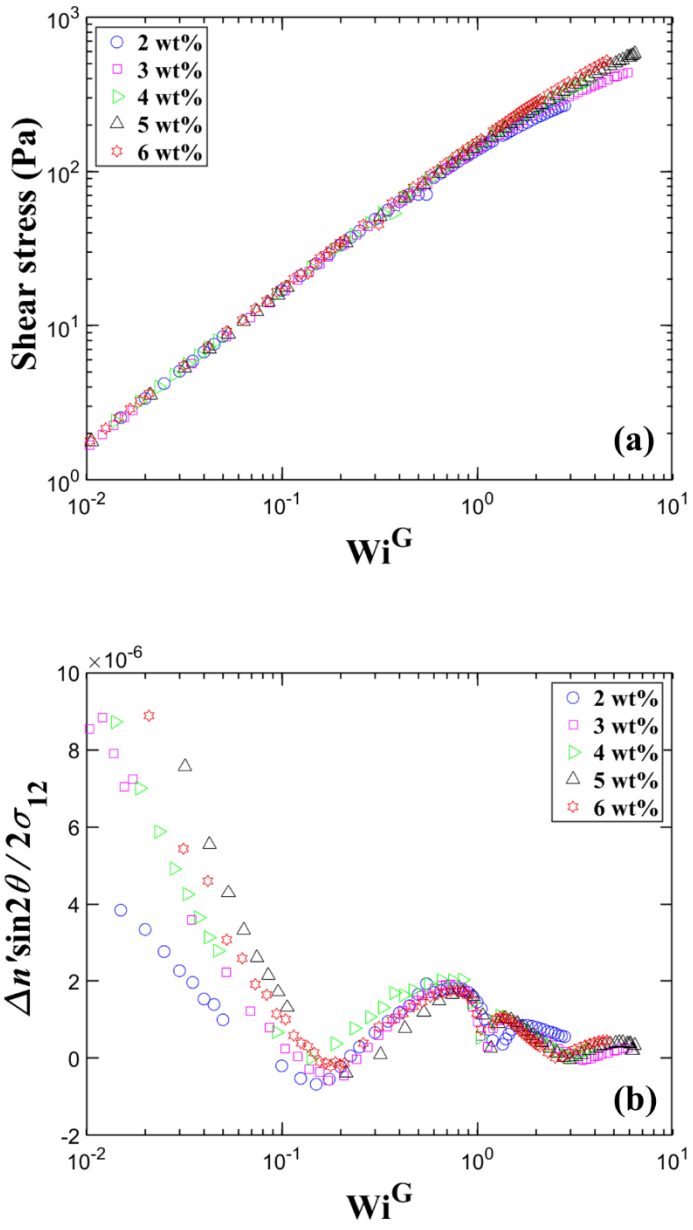

Fig. S6 Steady-state (a) shear stress and (b) stress ratio often employed to obtain the stress-optical coefficient (σ_{12} denotes the shear stress) as a function of dimensionless shear rate for a range of semidilute EC dispersions. According to the results in (b), no (constant) stress-optical coefficient may be assigned to the EC dispersions in this study.

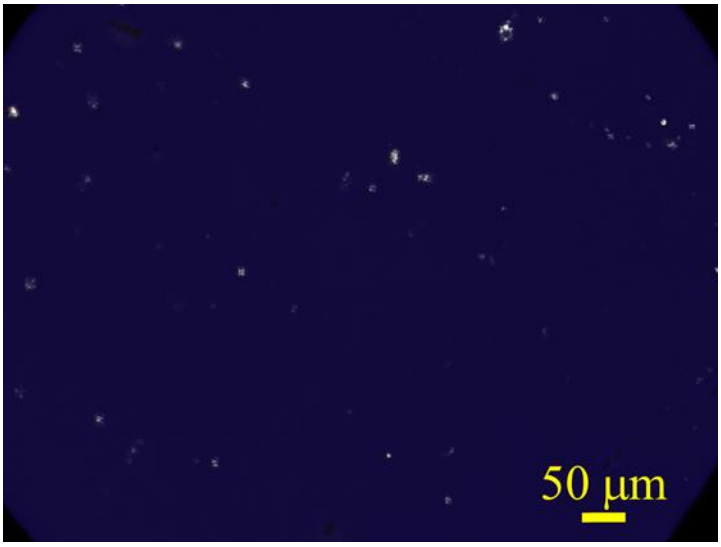

Fig. S7 Cross-polarized optical microscopy image of the 5 wt% EC dispersion taken from the microscope (Olympus BX51, Japan) equipped with a high resolution digital camera (Olympus DP22, Japan). The bright dots in this image are indicative of some static birefringence for the EC dispersion even at a quiescent state.