Electronic Supplementary Material (ESI) for Soft Matter.

Supplementary Information

Orthogonal Superposition Rheometry of Colloidal Gels: Time-Shear Rate Superposition

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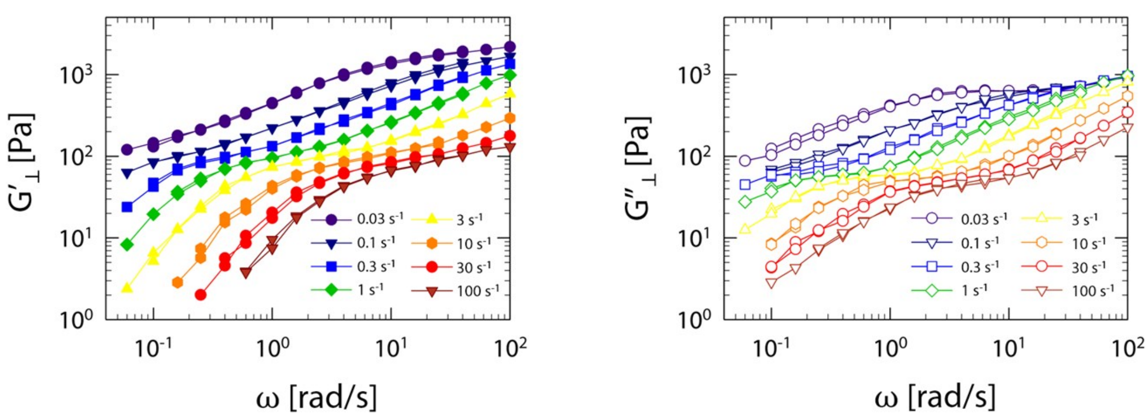

Fig. S 1 Repeat measurements of orthogonal superposition moduli at varied shear rates of 3.0 vol% dispersion of carbon black in a matrix with η_m=0.4 Pa·s.

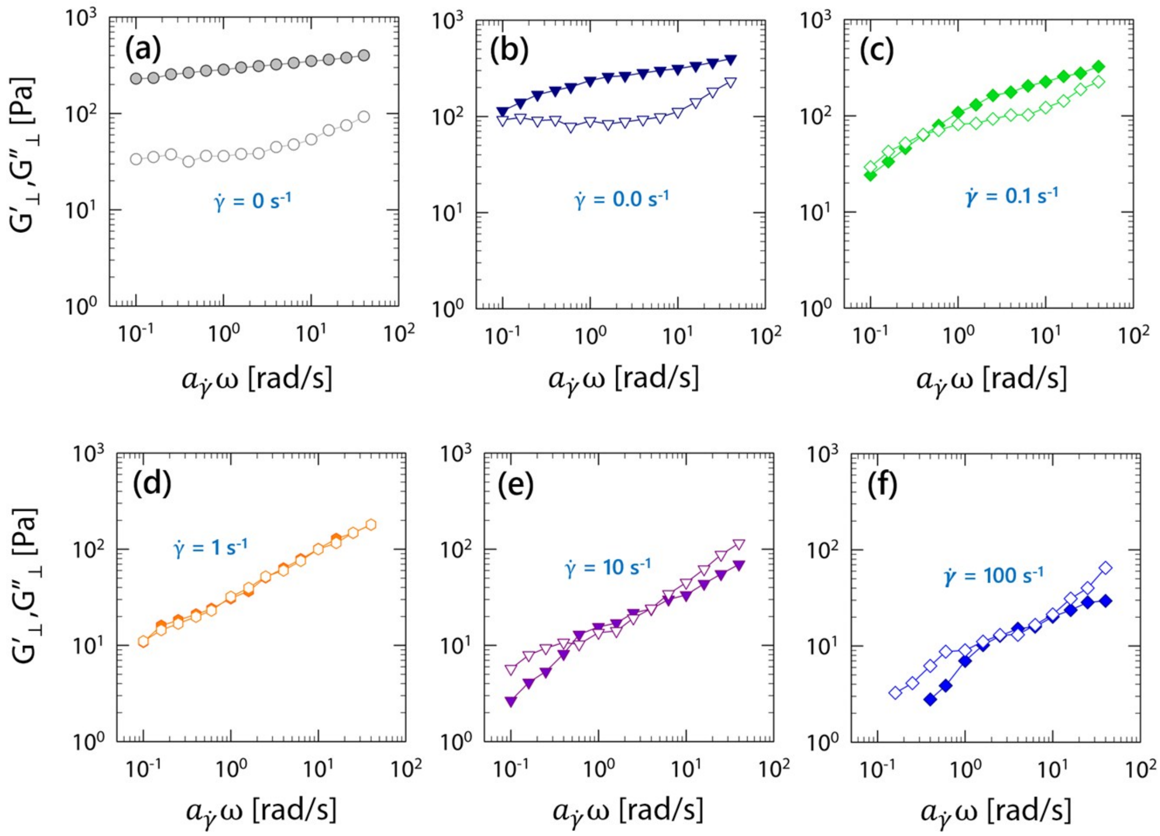

Fig. S 2 Orthogonal superposition moduli $G'_\perp$ and $G''_\perp$ as a function of frequency in a same plot of a 2.5 vol% fumed silica dispersion at different shear rates: (a)0 s^{-1}, (b)0.01 s^{-1}, (c)0.1 s^{-1}, (d)1 s^{-1}, (e)10 s^{-1} and (f)100 s^{-1}.

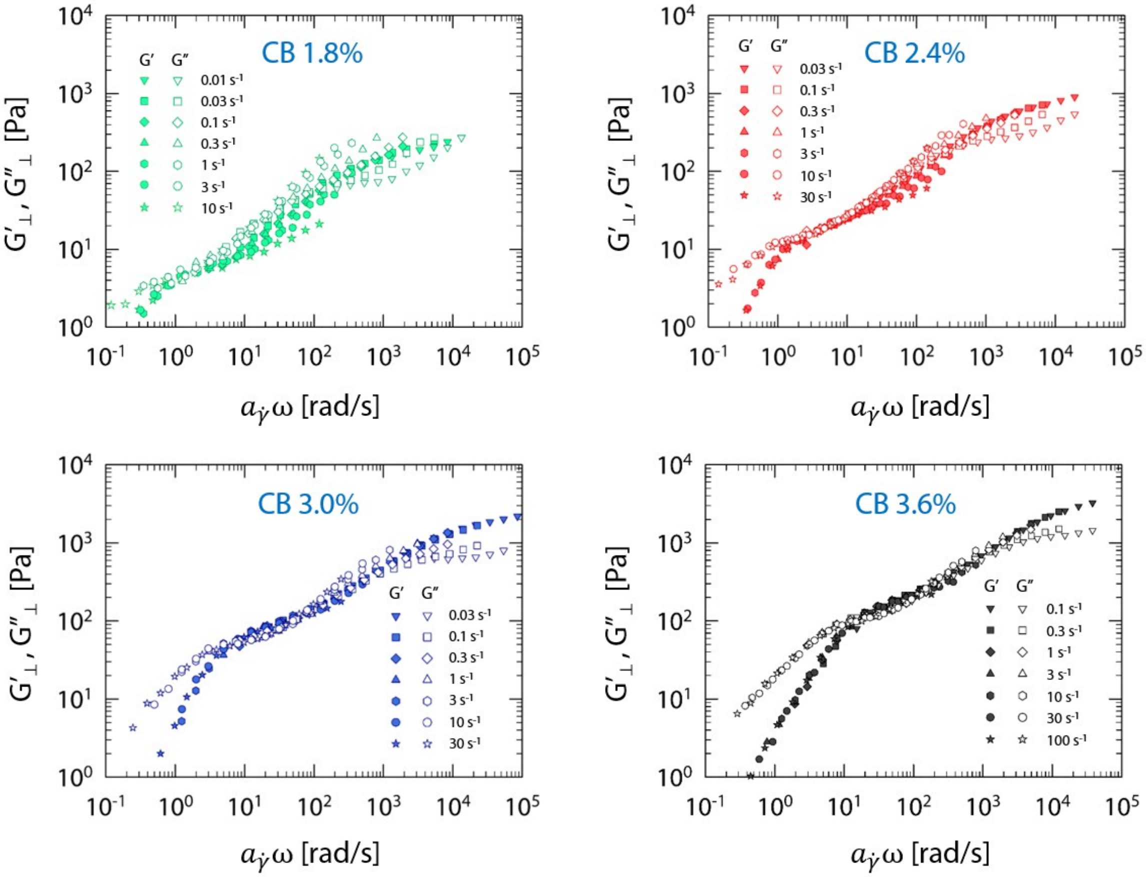

Fig. S 3 Orthogonal superposition moduli as a function of scaled frequency $a_{\dot\gamma}\omega$ of carbon black dispersions with different volume fractions in a matrix with η_m=0.4 Pa·s: 1.8 vol%, 2.4 vol%, 3.0 vol% and 3.6 vol%.

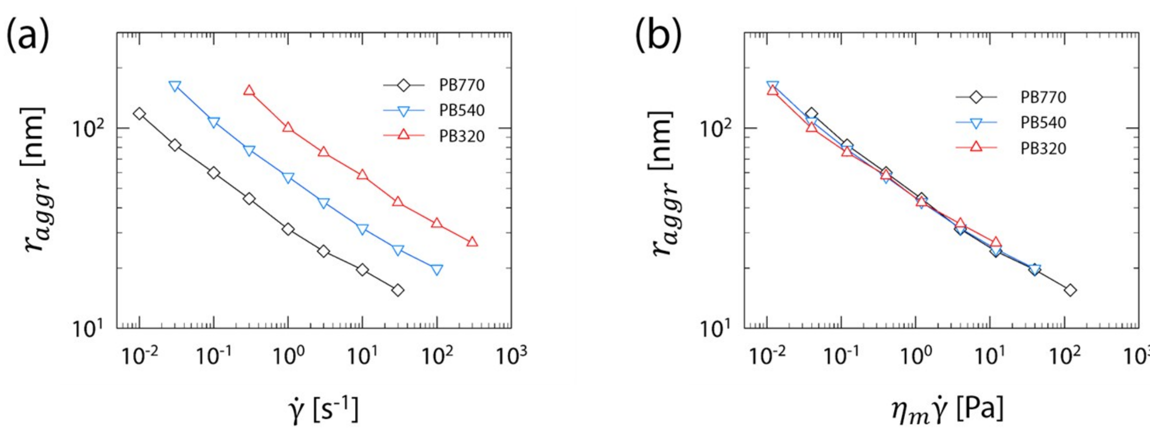

Fig. S 4 The aggregate size calculated according to the Stokes-Einstein equation, assuming that the time-shear superposition is caused by the slow Brownian relaxation of the aggregate velocity change as the aggregate size changes.

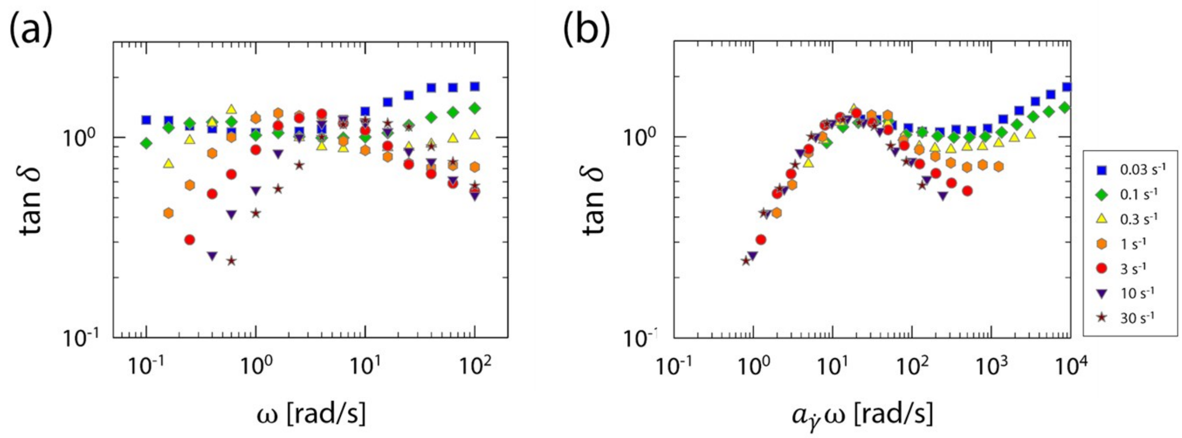

Fig. S 5 Orthogonal superposition $tan(\delta)$ versus (a) unscaled and (b) scaled frequency, at varied shear rates. The frequency at the minimum of unscaled data are used as inverse Brownian diffusion time to obtain the relaxation time of the gels under flow.