Supplementary material:

Structural change and dynamics of colloidal gels under oscillatory shear flow

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- Measures of initial colloidal gel on the cluster length scale.

**Figure S1:** Particle number distribution according to the cluster size at initial state. Among the 10648 particles used, 99% of the total particles are aggregated to form a colloidal gel network structure.
- Stress overshoot phenomena of the colloidal gel.

**Figure S2**: Stress overshoot behavior under startup shear flow. (Left) Dashed line indicates the strain, where the stress maxima are observed. Power-law increase of the stress maximum with Pe. (Right)
Frequency sweep result.

Figure S3: Storage modulus $G'(\omega)$ and loss modulus $G''(\omega)$ as a function of $Pe_\omega$. 
- Results at various strain amplitudes

$\text{Pe}_\omega = 2000$

**Figure S4:** Results at various strain amplitudes.