Supplementary Information

Dynamics and Yielding of Binary Self-Suspended Nanoparticle Fluids

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Figure S1. Size distribution of particles as determined from SAXS analysis for a) 10nm b) 25nm c) 50nm d) 80nm e) 200nm f) 360nm. The insets are the experimental scattering intensities (red dots) and the fit to data (black lines) for respective sizes.
Figure S2. Variation of particle core volume fraction, $\Phi$ with $x_L$ for different size ratios. The volume fraction is found to be around 0.10-0.15 for different systems.

Figure S3. Form factors for different systems at $r = 0.4$ on a log-log plot. The open symbols are experimental values and the black lines are mole fraction-weighted averages of the measured form factors for the pure species as used in literature.\textsuperscript{[45-47]}
Figure S4. Comparison of $S_{11}$, $S_{12}$ and $S_{22}$ components of $S(q)$ for a) $x_L = 0.7$ and b) $x_L = 0.25$. 
Figure S5 a) Variation of $G'$ and $G''$ as a function of time after preshear by strain sweep. b) Comparison of $g_2(q,t)$ measured initially and after 3600s for $x_L=0.4$ at $q=0.22$ nm$^{-1}$. Since the moduli and the $g_2(q,t)$ do not change with time, it indicates absence of any aging in the system.

Figure S6. Variation of stretching exponent, $\beta$ with wave vector $q$ at different $x_L$ values.
Figure S7. Storage modulus $G'$ (filled symbols) and loss modulus $G''$ (open symbols) as a function of angular frequency $\omega$ at a strain of $\gamma = 0.5\%$ at different values of $x_L$ for a) $r = 0.4$, b) $r = 0.2$, c) $r = 0.125$, d) $r = 0.05$ and e) $r = 0.027$. 
Figure S8. Normalized loss modulus, $G''/G''_{\gamma \rightarrow 0}$ at $\omega = 10$ rad/s with lognormal fits (dotted lines) for $r = 0.2$