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Time and volume fraction dependence of dynamic heterogeneity in a glass-forming binary hard-sphere mixture ELIJAH FLENNER, GRZEGORZ SZAMEL, Colorado State University - Chemistry Department — We examined dynamic heterogeneity in a glass-forming binary hard-sphere mixture for volume fractions up to and including the so-called mode-coupling transition. We calculated the dynamic susceptibility $\chi_4(t)$, the four-point structure factor $S_4(q;t)$ and the dynamic correlation length $\xi(t)$. We find that the correlation length increases with time as $\xi(t) \sim \ln(t)$ and is independent of ϕ for times approximately between the β and α relaxation time. The dynamic length plateaus at a ϕ dependent value $\xi_{\max}(\phi)$. We find that $\xi_{\max}(\phi)$ is proportional to the dynamic length at the α relaxation time, $\xi(\tau_\alpha)$. Finally, while for a limited range of volume fractions $\xi(\tau_\alpha) \sim \tau_\alpha^{1/z}$ with $1/z \approx 0.2$, we find that $\xi(\tau_\alpha) \sim \ln(\tau_\alpha)$ describes our data well for all ϕ.

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