

Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Dynamic Light Scattering Study of Carbon Nanoparticles Aggregating in Aerosol Phase RAJAN DHAUBHADEL, AMITABHA CHAKRABARTI, CHRISTOPHER M. SORENSEN, Kansas State University — Intensity correlation function was measured using ALV5000 correlator for the aerosol system created inside an optical chamber by exploding a mixture of a hydrocarbon (Acetylene) and oxygen. The observations were taken at two q (scattering wave vector) values $8.81 \mu\text{m}^{-1}$ and $24.20 \mu\text{m}^{-1}$, which for $\lambda = 488\text{nm}$ correspond to scattering angles 40° and 140° respectively. For a system with medium volume fractions ($\sim 8 \times 10^{-5}$) or higher it was observed that the decay in intensity correlation was exponential initially for up to about 1 minute and then transitioned to stretched exponential with stretched exponent of about 0.45 for $q = 24.20 \mu\text{m}^{-1}$ and 0.65 for $q = 8.81 \mu\text{m}^{-1}$. The value of intensity correlation function at small time is also found to decrease a little bit with time at both q . This indicates of the development of static scatterer in the scattering volume with time (gelling of the cluster). This also introduced non-ergodicity in the system.

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Date submitted: 20 Nov 2006

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