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Cluster Morphology and Aggregation Kinetics in Dense Aerosols RAJAN DHAUBHADEL, AMITABHA CHAKRABARTI, CHRISTOPHER SORENSEN, Kansas State University — We studied the cluster morphology and kinetics of an aggregating aerosol system using the small angle light scattering technique. Exploding a mixture of a hydrocarbon gas and oxygen in closed chamber generated a system of aggregating soot particles. The soot particles started as individual monomers, ca. 38 nm radius, grew to bigger clusters with time and finally stopped evolving after spanning a network across the whole system volume. The gelled clusters showed a hybrid morphology with a lower fractal dimension at length scales of a micron or smaller and a higher fractal dimension at length scales greater than a micron. The study of the kinetics of the aggregating system showed that the system gelled when the homogeneity λ attained a value 0.4 or higher. The aggregation kernel K appearing in SE was also determined using the light scattering data.. The observed data indicated a slight increase in K value when the system was denser.

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