

Abstract Submitted
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Shear History Independence in Colloidal Aggregation WILLIAM HEINSON, AMITABHA CHAKRABARTI, CHRISTOPHER SORENSEN, Department of Physics, Kansas State University — Stimulated by experiments, we have carried out detailed simulations of aggregation in the presence of shear in a model colloidal system with a short-range attractive potential. For weak shear rates we find that the shear enhanced the aggregation and that the long time state of the system is independent of the shear history. For strong shear rates, precipitous fragmentation occurred after the shear was turned on and after an induction period, the aggregation quickly rebounded in a stochastic manner similar to classical nucleation phenomena. However, the long -time state of the system is, once again, independent of the shear history. Thus, for both weak and strong shear cases, shear rate acts as a state variable of the aggregating system. Shear rates employed in the simulations can be attained in laboratory experiments as confirmed by computing the dimensionless Péclet numbers

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