315b Gelation or Self-Preservation during Turbulence-Induced Coagulation

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The coagulation kernel homogeneity is used to predict gelation and self-preservation for various mechanisms of turbulence-induced coagulation and verified by detailed sectional simulations. Self-preserving distributions are attained in the inertial regime (particle diameter, d_p, much larger than the Kolmogorov microscale of turbulence, η) while coagulation by accelerative mechanisms like fluid fluctuation or gravity in the viscous regime ($d_p << \eta$) leads to gelation. Shear-induced coagulation in the viscous regime (that is commonly used in aerosol dynamic simulations) leads to gelation also.