287h Fractal Gelation or Self-Preservation
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Commonly used rates for turbulence-induced coagulation are extended to non-spherical fractal like particles. 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. For spherical particles, self-preserving distributions are attained in the inertial regime ($d_p \gg \eta$) while coagulation by accelerative mechanisms like fluid fluctuation or gravity in the viscous regime ($d_p \ll \eta$) leads to slow gelation as well as shear-induced coagulation in the viscous regime. Non-sphericity or decreasing fractal dimension of particles shift the overall coagulation behavior towards gelation where only coagulation in the inertial regime shows self-preserving behavior.