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Dynamics of Cloud Point Transitions in Dilute Solutions of Gradient Copolymers with Prescribed Gradient Strengths KEITH GALLOW, YUEH-LIN LOO, Princeton University — We have investigated dilute solutions of gradient copolymers comprising hydroxyethyl methacrylate and dimethylaminoethyl methacrylate with different gradient strengths undergoing their cloud point transitions. The gradient strength defines the maximum difference in instantaneous compositions along the polymer backbone. Isothermal dynamic light scattering tracks the fractions of unimers and aggregates with which the half times characterizing this transition can be quantified. We find the temperature dependence of this transition to depend on gradient strength, ranging from -2.22 decades/°C for a random copolymer to -0.75 decades/°C for a gradient copolymer of comparable molecular weight and overall composition but a gradient strength of 0.52. The progressively shallower temperature dependence of this transition with increasing gradient strength suggests of a nucleation and growth mechanism of aggregate formation.

Keith Gallow
Princeton University

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