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Phase Behavior of Gradient Copolymer Solution GUNJA PANDAV, University of Texas at Austin, KEITH GALLOW, YUEH-LIN LOO, Princeton University, VENKAT GANESAN, University of Texas at Austin — We study the behavior of amphiphilic linear gradient copolymer chains under poor solvent conditions. Using Bond Fluctuation model and parallel tempering algorithm, we explore qualitative behavior of this class of polymers with varying gradient strength; which is the largest difference in the instantaneous composition along the polymer chain. Under poor solvent conditions, the chains collapse to form micelles. We find a linear dependence of hydrophilic to hydrophobic transition temperature on gradient strength. Systematic analysis of these clusters reveals a strong dependence of micelle properties on gradient strength. Also, we discuss our results with reference to recent experiments on synthesis and cloud point depression in gradient copolymers confirming gradient strength as key parameter in tuning micelle properties.

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