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Structure-Property Relationships for Branched Worm-Like Micelles GREGORY BEAUCAGE, DURGESH RAI, University of Cincinnati — Micellar solutions can display a wide range of phase structure as a function of counter ion content, surfactant concentration, and the presence of ternary components. Under some conditions, common to consumer products, extended cylindrical structures that display persistence and other chain features of polymers are produced. These worm-like micelles (WLMs) can form branched structures that dynamically change under shear and even in quiescent conditions. The rheology of these branched WLMs is strongly dependent on migration of the branch points, and the dynamics of branch formation and removal. Persistence and other polymer-based descriptions are also of importance. We have recently developed a scattering model for branched polyolefins and other topologically complex materials that can quantify the branching density, branch length, branch functionality and the hyperbranch (branch-on-branch) content of polymers. This work is being extended to study branching in WLMs in work coupled with Ron Larson at UMich to predict rheological properties.

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