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Small Angle Neutron Scattering for the Detection of Branching in Worm-Like Micellar Systems KARSTEN VOGTT, University of Cincinnati, DURGESH RAI, Oak Ridge National Laboratory, GREGORY BEAUCAGE, University of Cincinnati — Micellar solutions can exhibit a broad variety of phase structure as a function of counter ion content, surfactant concentration, and the presence of ternary components. Under some conditions 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. 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. Using small angle neutron scattering these parameters are determined for model emulsions with varying surfactant and salt concentrations.

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