

Abstract Submitted
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Structure and Rheology of Shear-Banding Wormlike Micellar Solutions NORMAN WAGNER, University of Delaware — Measurements of the micellar alignment, flow kinematics, and microstructure are presented for three WLM solutions. A special SANS flow cell enables the first direct measurements of the microstructure and micellar alignment in each individual band. These gap resolved 1-2 plane experiments demonstrate that the degree and orientation of segmental alignment of the micelles by the shear flow correlate with the measured shear viscosity. Combining the SANS measurements with flow-light scattering measurements shows that shear induces strong concentration fluctuations in the high shear band. These results show two distinctly different types of shear banding that is related to the underlying equilibrium phase behavior. The results help elucidate the mechanism driving shear banding in WLMs.

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