Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Shear SANS Study of Entangled Polymer Solutions HOWARD WANG, Department of Materials Science and Engineering, Michigan Technological University, Houghton, MI 49931, LIONEL PORCAR, DEREK L. HO, NIST Center for Neutron Research, National Institute of Standards and Technology, Gaithersburg, MD 20899, PRASHANT TAPADIA, SHI-QING WANG, MICHAEL OLECHNOWICZ, RODERIC QUIRK, Maurice Morton Institute of Polymer Science and Department of Polymer Science, University of Akron, Akron, Ohio 44325 — In situ small angle neutron scattering and rheological measurements have been carried out on entangled polybutadiene solutions in simple shear flow in a Couette shear cell (SANS) and cone/plate cell (rheology). Stable shear flow has been achieved over a range of shear rates covering the stress plateau, at which polymer chains are expected to partially disentangle [1]. Shear-induced structure was recorded in both the flow-vorticity and gradient-vorticity planes. The data appeared to imply the absence of ensemble averaged large chain deformation in steady state, whereas geometrical scaling analysis suggested that chain stretching could occur locally. [1] Tapadia, P.; Wang, S. Q. Macromolecules, 37, 9083 (2004).

Howard Wang
Michigan Technological University

Date submitted: 07 Dec 2004 Electronic form version 1.4