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Overcoming the difficulty in performing large step-strain experiments: A first reliable comparison with Doi-Edwards tube model PAULA X. WANG, SHI-QING WANG, Department of Polymer Science, The University of Akron — Large step shear has been a popular way to interrogate nonlinear viscoelastic responses of polymeric materials. In absence of any severe interfacial failure, the experimental data [1] were found to agree with the Doi-Edwards model of entangled chains. A separate set of experimental studies [2-4] produced strain-softening and showed disagreement with the D-E model. We have successfully prevented interfacial breakdown for the first time to show that the strain-softening is an interfacial artifact [5] and that the stress relaxation behavior of entangled melts and solutions can be reliably depicted experimentally and accounted for within the D-E model.
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