FRICTION COEFFICIENT DOES NOT STAY CONSTANT IN NONLINEAR VISCOELASTICITY

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It is well known that the elongational behavior of polystyrene melts in fast flows, both mono- and bi-disperse, does not fit the predictions of the standard model for entangled polymers. In an effort to account for the discrepancy, the contribution of an interchain pressure was suggested some years ago. The suggestion, while possibly consistent with the monodisperse polymer data initially available, does not explain the later collected blend data in a convincing way. A different suggestion is therefore proposed, based on the assumption that the monomeric friction coefficient does not stay constant in the nonlinear range of the viscoelastic response, contrary to the standard picture of the classical theory. To test this hypothesis, molecular dynamics simulations must be used, and preliminary results are here reported, showing that indeed the friction coefficient of the polystyrene monomer decreases with increasing shear rate.