



INVESTIGATION OF THE RHEOLOGICAL BEHAVIOR OF POLYMER MELTS IN EQUIBIAXIAL ELONGATIONAL FLOWS

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Equibiaxial elongational deformations, where a fluid element is stretched equally in two directions while it contracts in the third direction, occur in numerous technologies that include the processing of synthetic polymers and foodstuffs. Despite this importance, the rheological behavior of complex fluids in equibiaxial elongational flow is largely unexplored. Recently, we have demonstrated that limitations caused by uncontrolled lubricant thinning encountered in the Lubricated Squeezing Flow (LSF) technique are resolved in the novel Continuous Lubricated Squeezing Flow (CLSF) technique developed in our laboratory. To our knowledge, CLSF is the only experimental technique capable of generating large and homogeneous equibiaxial deformations in complex fluids. Here, we investigate the behavior of polymer melts with the goal of understanding the relationship between molecular architecture (molecular weight distribution and chain branching) on rheological behavior in constant strain rate deformations. Experimental results will be compared to predictions from molecular models for linear and branched polymers.