

Abstract Submitted
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Measurement of the extensional viscosity for Newtonian and viscoelastic liquids using the selective withdrawal technique E. TREJO-PEIMBERT, R. ZENIT, Universidad Nacional Autonoma de Mexico, J.J. FENG, University of British Columbia — Extensional viscosity is hard to measure. None of the existing devices offers a definite solution to determine this property for both viscous and viscoelastic liquids. This is the main motivation of this investigation: to find an alternative and reliable method to measure this property. We propose the use of a device inspired in the well-known selective withdrawal system. A viscous fluid is withdrawn near the interface from below with a tube. The suction generates the deformation of the free surface and the flow beneath is largely extensional. We conducted measurements of the extension rate using PIV and measured the surface deformation to infer the extensional stress. By knowing these two quantities the value of the extensional viscosity is calculated. We present the measurements obtained for both viscous Newtonian and several non Newtonian fluids. For Newtonian fluids, we do obtain measurements of the Trouton ratio close to 3. We observe a variety of interesting behaviors for non Newtonian liquids, which will be presented and discussed.

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