

Stress-induced Disentanglement Transition in Simple Shear of Entangled Polymer Solutions

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Our recent experiments show¹ that well-entangled polymer solutions undergo a constitutive flow transition when subjected to a shear stress comparable to or higher than the elastic plateau modulus. During such a transition, the measured shear rate may jump orders of magnitude, accompanied by higher flow birefringence and normal stress. More detailed characteristics will be described to elucidate the nature and origin of the observed flow phenomena, which appears to be highly universal and contradicts the current theoretical understanding² based on the refined reptation models.

¹ P. Tapadia and S.Q. Wang, *Phys. Rev. Lett.* **91**, 198301 (2003).

² J. Bent *et al*, *Science* **301**, 1691 (2003); R. Graham, A. Likhtman, T. McLeish and S. Milner, *J. Rheol.* **47**, 1171 (2003).