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Viscoelastic properties of ultrathin polymer films using the liquid dewetting technique JINHUA WANG, GREGORY MCKENNA, Department of Chemical Engineering, Texas Tech University, Lubbock, Texas, 79409 — There is considerable interest in studying the behavior of polymers at the nanoscale. Here we describe experiments using the Bidiguel and Fretigny's liquid dewetting technique in which no great glass transition temperature (Tg) reduction or rubbery plateau compliance change for polystyrene (PS) films was observed [1]. These results are contrary to observations by others of Tg reductions on free standing polystyrene films and of large rubbery stiffening observed in our lab using a bubble inflation method [2,3]. Preliminary results of PS film dewetting are consistent with the Bidiguel and Fretigny's results. Also, annealing time and confinement effects on the creep behavior of polystyrene thin film were examined. Then, the range of investigated materials is being expanded to polycarbonate (PC) and poly(methyl methacrylate) PMMA with the ultimate goal to determine the reasons for the differences between the bubble inflation method and liquid dewetting technique of polymer film charicterization. References: [1] H. Bodiguel and C. Fretigny, "Viscoelastic dewetting of a polymer film on a liquid substrate," *Eur.Phys. J. E.*, 19, 185-193 (2006). [2] K. Dalnoki-Veress, J. A. Forrest, P. G. de Gennes and J. R. Dutcher, *J. Phys. IV.*, 10, 221-226 (2000). [3] O' Connell P. A. and McKenna G. B., "Rheological Measurements of the Thermoviscoelastic Response of Ultrathin Polymer Films", *Science*, 307, 1760-1763 (2005).

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