Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Temperature Step Dewetting Method for Determination of T_g Dependence on Thickness for Linear and Star Branched Polystyrene[1]

ASTRID TORRES ARELLANO, GREGORY MCKENNA, Texas Tech University

— The current liquid dewetting study is an extension of work previously presented by Bodiguel and Fretigny [Phys. Rev. Lett., **97**, (2006)] and Wang and McKenna [J. Polym. Sci., Part B: Polym. Phys., **51**, (2013)]. The liquid dewetting method consists of floating a thin polymer film on a liquid (glycerol) substrate. The film shrinks in a homothetic way while the thickness increases. The current goal is to obtain the glass transition temperature T_g as a function of thickness h for low and high molecular weight linear polystyrene (PS), long branched 3 arm star PS, and short and long branched 8 arm star PS. In the normal dewetting method and in pseudo-thermodynamic methods a new sample is required to obtain the T_g vs. h for each individual thickness. The temperature step dewetting technique can be used to obtain the T_g vs h dependence using one single thin polymer film with initial known thickness h_o. Thereby, obtaining rapidly the same information that would have required multiple individual tests. The T_g reductions are compared to previously presented liquid dewetting results, as well as those for supported and freely standing polystyrene thin films.

[1]National Science Foundation grant DMR - 1207070 and John R. Bradford Endowment at Texas Tech University.

Astrid Torres Arellano
Texas Tech University

Date submitted: 13 Nov 2014 Electronic form version 1.4