Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Glass Transition Temperature of Polystyrene Thin Film on Polystyrene Brush[1] ANDREW CLOUGH, YOSHIHISA FUJII, JESSICA LEACH, OPHELIA TSUI, Boston University — Numerous experiments have shown that the T_g of thin polymer films can differ noticeably from the bulk value, exhibiting a dependence on both the film thickness and conditions at the film interfaces. Similar behavior has been observed in the T_g of silica-nanoparticle-polystyrene composites where the average inter-particle separation assumes the role of the film thickness. However, the similarity ceases when the nanoparticles are altered by grafting a layer of polystyrene brush to the particle surface. We study the T_g of polystyrene thin films supported by silicon grafted with a layer of polystyrene brush using ellipsometry. Preliminary result indicates that the T_g depression observed on a low-molecular-weight brush is the same as that for polystyrene films on silicon. We will present our observations and discuss our interpretation for the data.

[1]We are grateful to the supports of the ACS Petroleum Research Fund (Project No. 47882-AC 5) and NSF (Project No. DMR-0706096 and DMR-0908651).

Andrew Clough
Boston University

Date submitted: 20 Nov 2009 Electronic form version 1.4