Glass Transition Temperature of Polystyrene Thin Film on Polystyrene Brush\textsuperscript{1} ANDREW CLOUGH, YOSHIHISA FUJI, 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.

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