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Influence of Irreversible Adsorption on the Glass Transition Temperature of Polymer Thin Films as Measured by Fluorescence MARY BURROUGHS, RODNEY PRIESTLEY, Department of Chemical and Biological Engineering, Princeton University — Polymers confined to the nanometer length scale have been shown to exhibit deviations in the glass transition temperature (T_g) from the bulk. With the increasing use of confined polymers in nanotechnology, understanding and predicting this behavior is extremely relevant to industries ranging from pharmaceuticals to organic electronics. Recent work (Napolitano, Wübbenhorst, Nature Communications, 2, 260 (2011)) has connected deviations in T_g under confinement with irreversible physical adsorption of polymer chains at substrate interfaces. Here we investigate the influence of irreversibly adsorbed layers on the T_g of polystyrene (PS) thin films supported on silica via fluorescence. We examine the T_g of the brushes as a function of annealing time and irreversibly adsorbed layer thickness. By incorporating fluorescently labeled polymer layers into multilayered films of unlabeled polymer, we will examine the influence of brushes on adjacent layers dynamics. Finally, we will compare the results on PS with those of poly(methyl methacrylate).

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