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Modification of Silicon Oxide Surfaces with Thermally Annealed Polystyrene Films STEVEN KALAN, KEVIN CAVICCHI, ALAMGIR KARIM, University of Akron — The modification of silicon with a native oxide surface has been accomplished by annealing thin films of anionically polymerized polystyrene spun-coat from solution at elevated temperature followed by dissolving the film in solvent to leave a thin layer of adsorbed polymer that persisted even after prolonged desorbing in solvent even at elevated temperature. It was found by water contact angle analysis of the samples after washing with organic solvent that annealing is a key step to adsorption of a thin layer of polystyrene on the film surface. X-ray reflectivity analysis also demonstrated that the thickness of the adsorbed layer is proportional to the molecular weight of the polymer. However, the contact angle showed a non-monotonic dependence on molecular weight. The further modification of these surfaces by ultraviolet/ozone treatment will be discussed. This is a novel surface treatment method as it performed with a polystyrene polymer without any additional chemical functionality through straight-forward vacuum annealing and washing with organic solvent.

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