

Abstract Submitted
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Polymer-Substrate Interactions in Irreversible Adsorption MARY

J. BURROUGHS, RODNEY D. PRIESTLEY, Princeton University — Annealing a supported polymer film in the melt state, a common practice to relieve residual stresses and clear thermal history, results in the growth of an irreversibly adsorbed layer. This layer of polymer chains physically adsorbed to the substrate has been shown to influence thin film properties such as diffusion and glass transition temperature. Its growth is attributed to many simultaneous interactions between individual monomer units and the substrate, stabilizing chains against desorption. This suggests that specific polymer-substrate interactions influence its development. A better understanding of how these interactions influence the growth and properties of the adsorbed layer is needed, particularly given how strongly the properties of confined polymeric systems are impacted by their interfaces. We strive to give insight into how these different interaction strengths influence the growth and behavior of the adsorbed layer. Both homopolymers and random copolymers are used to examine the influence of chemical composition and resulting polymer-substrate interactions on the growth and structure of these adsorbed layers. Understanding the implications of annealing and their variation with polymer-substrate interactions is essential in determining proper selection and processing of polymer thin films for applications.

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