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Grafting and Loop Formation of Telechelic Polymers at Interfaces Monitored by Fluorescence Labeling ZHENYU HUANG, HAINING JI, JIMMY MAYS, MARK DADMUN, Dept. of Chemistry, University of Tennessee, TN 37996 — The results from Monte Carlo simulation and mechanical tests have demonstrated that the formation of loops at polymer-polymer interfaces by multi-block copolymers provides an efficient method to improve the strength of biphasic interfaces. In this study, a simple system was generated to model loop formation at interfaces. Telechelic polystyrene terminated with carboxy endgroups was grafted from melt onto a silicon wafer modified with epoxy-terminated silane layers. The free carboxyl end groups in PS layers were labeled with 1-pyrenyldiazomethane (PDAM) and the fluorescence spectra were recorded. The grafting and loop formation of PS on the substrate can thus be monitored. Combined with ellipsometry, contact angle measurements and AFM, the effect of the chain length and concentration of PS on the kinetics of grafting and loop formation were studied. The obtained results provide a method to control the loop formation at interfaces therefore provide an opportunity to further understand the role of the loops in the interfacial properties in multi-component polymer systems.

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