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Grafting of Telechelic Polymers onto Functionalized Substrate in Polymeric Matrices RUJUL MEHTA, ZHENYU HUANG, HAINING JI, Department of Chemistry, University of Tennessee, Knoxville, TN 37996, JIMMY MAYS, MARK D. DADMUN, Department of Chemistry, University of Tennessee, Knoxville, TN 37996; Chemical Science Division, Oak Ridge National Laboratory, Oak Ridge, TN 37831 — We have investigated the grafting of polymer chains on an inorganic surface by reaction of the functional end-groups on the polymer chains. Specifically, polystyrene (PS) terminated at one or both ends with carboxylic acid groups is grafted onto silica modified with epoxy groups by spin coating a thin film of a blend of reactive and non-reactive PS onto the silica wafer and promoting the grafting reaction. This generates a model system to study the impact of the volume fraction of reactive polymer and the chain length of both reactive and matrix polymers on the resultant grafted brush. The interfacial excess isotherms are correlated to a theoretical model proposed by Shull, which describes the end adsorption of polymers at polymer/substrate interfaces in brushes based on scaling arguments and self-consistent field theory. Comparison is made between the characteristics of brushes formed from PS chains that are reactive at one or both ends.

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