

Effect of polydispersity in the grafting to reaction on N-type polymeric dopants

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Abstract

In this thesis work we studied the effect of polydispersity during the grafting process of equimolar mixture of phosphorus-terminated polystyrenes. The project is based on a first part, linked to the synthesis and characterization of these phosphorus-terminated polymers, in which samples with different molecular weights and characterized by low polydispersity indexes were obtained. Subsequently, the polymers were mixed in pairs, each characterized by two samples having different molecular weights, and the mixtures thus obtained were deposited on silicon substrates by spin-coating. The mixture were then grafted onto the substrates by heating at different temperatures and the thicknesses and composition of the polymeric films were evaluated by spectroscopic ellipsometry and TGA-GC-MS, respectively. A preferential enrichment of the lowest molecular weight component was systematically observed in all experiments. Unlike what was previously published for hydroxy-terminated polymers, using P-terminated polystyrenes this enrichment is dependent on both the time and the temperature used in the grafting process.

PhD Seminar

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