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Surface Dynamics of Highly Branched Polystyrene in Melt SEWOO YANG, JAESIK LEE, Dept of Polymer Science, The University of Akron, ZHANG JIANG, SUNIL K. SINHA, Dept of Physics, University of California at San Diego, SANGHOON SONG, HYUNJUNG KIM, Dept of Physics, Sogang University, SURESH NARAYANAN, Advanced Photon Source, Argonne National Laboratory, MARK D. FOSTER, Dept of Polymer Science, The University of Akron — We have investigated the surface dynamics of highly branched polystyrene (PS) film using x-ray photon correlation spectroscopy (XPCS). Several highly branched PS chains of well-defined molecular architecture were synthesized anionically. Speckle patterns of films of the branched PS chains of thickness ($\sim$ 100 nm) were measured at temperatures above T_g of the bulk chains and both the scattering of a single pattern analyzed and time correlation performed to obtain correlation functions. The temperature dependence for the q-dependent relaxation time was determined and estimates of the surface tensions of the different polymers derived from the static structure factors. The viscosities of the films determined by analyzing the XPCS data using capillary wave theory are compared with values obtained from bulk samples using rheological measurements.

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