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Surface Dynamics of Highly Branched Polystyrene in Melt
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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 (~ 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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