

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Polymer dynamics during capillary flow into nanopores ANATOLI SERGHEI, THOMAS P. RUSSELL, University of Massachusetts Amherst — Ordered arrays of parallel cylindrical nanopores (with a narrow pore size distribution and diameters down to 10 nm) are used as measurement platforms in the field of polymer nano-fluidics, in particular, to investigate the capillary flow of polymers in 2D geometrical nano-confinement. Several aspects of the polymer dynamics – manifested on time scales covering more than 10 orders of magnitude – are investigated during the flow process: (i) molecular fluctuations corresponding to the segmental dynamics (dynamic glass transition), (ii) chain dynamics, as revealed – for the case of type-A polymers – in fluctuations of the end-to-end distance, (iii) velocity of the capillary flow in dependence on the diameter of the nanopores. The results are compared to the polymer dynamics in the bulk.

Anatoli Serghei
University of Massachusetts Amherst

Date submitted: 13 Nov 2009

Electronic form version 1.4