

Abstract Submitted
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The Size of the Dynamic Bead in Polymers ALEXANDER AGAPOV, Polymer Science Department, University of Akron, Akron, OH 44325-3909, ALEXEI SOKOLOV, Chemical Sciences Division, Oak Ridge National Laboratory and Chemistry Department, University of Tennessee, Knoxville, TN 37996-1600 — Neutron spectroscopy is, currently, one of the most powerful tool to probe the polymer dynamics in space and time. Employing the Neutron Spin-Echo (NSE) technique it is now possible to investigate the relaxation processes from picosecond to nearly microsecond time regime, i.e. from local beta-relaxation to large-scale motions such as Rouse dynamics and reptation. We have analyzed the available neutron scattering literature data on Rouse dynamics for six different polymers. The performed analysis provided the direct estimate of the characteristic dynamic bead size. We show that the traditionally defined Kuhn segment length, fails to describe consistently the chain dynamics and statistics in these six polymers. Understanding the contradiction between the traditional Kuhn segment and experimentally obtained dynamic bead size still remains a challenge.

Alexander Agapov
Polymer Science Department, University of Akron,
Akron, OH 44325-3909

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