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Segment diffusion and nuclear magnetic resonance spin-lattice relaxation of polymer chains confined in tubes: Analytical treatment and Monte Carlo simulation of the crossover from Rouse to reptation dynamics

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Abstract

The dynamics of polymer chains in model tubes of variable diameter and varying chain and wall potentials was studied. The study was carried out using analytical treatment and Monte Carlo simulations of the crossover from Rouse to reptation dynamics. It was found that depending on the tube diameter, a crossover from Rouse to reptation behavior occurred.

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