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Random Walk of Chain Molecules Along Pore Axis GUIDUK YU, School of Chem. and Bio. Eng., Seoul National University, SERGEI OBUKHOV, Dpt. of Physics, University of Florida, JIUN-TAI CHEN, Dpt. of Polym. Sci. and Eng., University of Massachusetts Amherst, JUNE HUH, School of Mater. Sci. and Eng., Seoul National University, YOONTAE HWANG, SOONCHUN MOK, School of Chem. and Bio. Eng., Seoul National University, PRIYANKA DOBRIYAL, Dpt. of Polym. Sci. and Eng., University of Massachusetts Amherst, PAPPANNAN THIYAGARAJAN, Intense Pulsed Neutron Source Division, Argonne National Laboratory, THOMAS P. RUSSELL*, Dpt. of Polym. Sci. and Eng., University of Massachusetts Amherst, KYUSOON SHIN*, School of Chem. and Bio. Eng., Seoul National University — We investigated the overall conformation of polymer chain in cylindrical nanopores using small-angle neutron scattering. The mixture of hydrogenous PS and deuterated PS is confined in nanopores. Surprisingly, the overall conformation of polymer chains along the pore axis is observed to be the same as that in bulk. Even though the chain dimension is larger than the radius of the pores, the chains along the pore axis are not stretched, but sustain to be in unperturbed state. The SANS results implicate that the interpenetration of polymer chains decreases as polymer enters nanopores. We expect the reduction of intermolecular entanglement possibly alters other physical properties of polymer under nanoconfinement.

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