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The effect of chain stiffness on the morphology of diblock copolymers G. LEUTY, J. BEDARD, MESFIN TSIGE, Southern Illinois University — One of the most interesting and challenging problems in the science of materials concerns the structure and dynamics of the morphology of block copolymers. These materials generally consist of two or more homopolymer chains or blocks that are covalently bonded to each other to form a single polymer chain. Variation in the stiffness of the different block segments can directly affect the morphology of the system and may thus result in a very rich phase behavior. In the present study, the microphase separation of symmetric diblock copolymers with variable block stiffness and chain length is studied using coarse-grained molecular dynamics simulations. In the lamellar phase, the equilibrium lamellar spacing and orientation of the block segments in the system are found to depend on the relative stiffness between the two block segments. As the chain length of the block segments increases, the morphology changes from the expected lamellar appearance to a cylindrical one.

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