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The Equilibrium Partitioning of Block Copolymer at Critical Condition YONGMEI WANG, SHAZIA KHAN, WENHUA JIANG, Department of Chemistry, The University of Memphis, Memphis, TN 38152 — The partitioning of diblock (AB) and triblock copolymers (ABA and BAB) into a slit pore with the B block set at the critical condition were investigated with lattice Monte Carlo simulations and were compared with the partitioning of a homopolymer (A) with the same length of the A block. The study aims to understand the effect of block copolymers architecture on the elution pattern of these copolymers in chromatography study with one of the blocks being made "invisible". The partition coefficient of a diblock copolymer chain (AB) is found to be larger than that of the homopolymer (A) and the difference is more significant when the visible A block length is much shorter than the invisible B block length. This would suggest that the diblock copolymer (AB) with the B block at the critical condition would elute later than the corresponding homopolymer A would. As a result, the estimation of the molecular weight of A block in AB copolymer based on the elution time of the copolymer at the critical condition would be underestimated. For the triblock copolymers, the partition coefficient for ABA was found to be smaller than those for AB and BAB. Hence ABA would elute earlier than AB and BAB. The simulation results are in good agreement with experimental results of elution times of copolymers at the critical conditions in liquid chromatography.

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