Simulation of Line Edge Roughness in Weakly Segregated and Strongly Segregated Diblock Copolymer Resists

AUGUST BOSSE, Polymers Division, National Institute of Standards and Technology — We discuss phase-field simulations of $A-B$ interfacial roughness (i.e., “line edge roughness”) in weakly segregated and strongly segregated $AB$ diblock copolymer resists. Line edge roughness—in particular, long-wavelength line edge roughness—can be especially troublesome for resist scientists because of its ability to disrupt final device function. We examine the relative magnitude and spectral character of long-wavelength line edge roughness in weakly segregated and strongly segregated $AB$ diblock copolymer resists using a stochastic version of the Leibler-Ohta-Kawasaki phase-field theory of block copolymer ordering [T. Ohta and K. Kawasaki, *Macromolecules* 19, 2621 (1986)].