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Theory of Hydrogen-Bonding in Diblock Copolymer/Homopolymer Blends ASHKAN DEHGHAN, AN-CHANG SHI, McMaster University — The phase behavior and physical properties of hydrogen-bonding diblock copolymer/ homopolymer (AB/C) blends are examined using self-consistent field theory. We consider two methods for modeling the formation of hydrogen bonds between polymer chains. The first using a large negative (attractive) interaction parameter and the second using polymer-polymer complexation. Despite the success of the first model in describing the phase behavior of the system, it fails to correctly predict the change in lamella spacing induced by addition of homopolymer chains, previously shown in many experiments. Using polymer-polymer complexation we were able to qualitatively show the order-order phase transitions and decrease in lamella spacing for the case of strong hydrogen bonding. Our analysis of both methods show that hydrogen bonding of polymer chains should be described by polymer-polymer complexation.

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