

Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Theory of Lamellar Growth in Polymer Solutions ARINDAM KUNDAGRAMI, M MUTHUKUMAR, Polymer Science and Engineering, University of Massachusetts, Amherst — We investigate theoretically the crystallization of polymers in dilute solutions. Nucleation-controlled crystal growth in a diffusive environment is considered. The single-crystal lamella is modelled by a cylindrical tablet of fixed thickness undergoing radial growth. The entropic barrier, adjacent to the growing surface, is modelled by a suitable entropic force. The temperature (supercooling) dependence is inherent in the diffusion constant and in the barrier term. By solving the boundary value problem including a moving boundary representing the crystal-solution interface, the temperature and concentration dependence of the growth rate are calculated. Our theoretical results are compared with simulation results, experimental data, and the Lauritzen-Hoffman theory.

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Date submitted: 30 Nov 2004

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