Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Nucleation in Polymer Blends TIMOTHY RAPPL, NITASH BALSARA, University of California, Berkeley — The initial stages of phase separation in an off-critical binary mixture of model polyolefins were studied by time-resolved small angle neutron scattering. We focus on nucleation in the metastable regime which is bounded by the binodal, the location where the nucleation barrier is infinite, and the spinodal, where the nucleation barrier is unimportant. This broad range of barrier heights renders study of the early stage of nucleation a challenging endeavor. We have met this challenge by subjecting our blend to both single- and two-step quenches within the phase separated region of the phase diagram. This enables measurement of the size of the critical nucleus over 80% of the metastable regime. Some aspects of nucleation kinetics follow the linearized theory of Cahn, Hilliard, and Cook, which was originally developed to describe spinodal decomposition.

Timothy Rappl
University of California, Berkeley

Date submitted: 01 Dec 2004 Electronic form version 1.4