

Abstract Submitted  
for the MAR10 Meeting of  
The American Physical Society

**Is chain end retardation responsible for anomalous dependence of crystal growth rate on molecular weight?** JESSICA L. CARVALHO, SARA L. CORMIER, NAN LIN, KARI DALNOKI-VERESS, Department of Physics & Astronomy and the Brockhouse Institute for Materials Research, McMaster University, Hamilton, ON, Canada, L8S 4M1 — We present results on a robust anomaly in the crystallisation of blends of poly(ethylene oxide) (PEO) of differing molecular weight,  $M_w$ . Previous studies probing PEO blends have mainly focused on blends of low  $M_w$ , for which integral chain folding is important, with very high  $M_w$ . The PEO samples used in this study consist of a blend with both  $M_w$ 's well above the integral chain folding limit. In general, one would expect that such blends should show a monotonic decrease in spherulite growth rate,  $G$ , as the blend contains more high- $M_w$  component. Our results however show a clear non-monotonic  $G$ , with a minimum in a plot of  $G$  as a function of the volume fraction. Surprisingly, blending a small amount of lower-  $M_w$  PEO into a higher-  $M_w$  PEO slows the growth kinetics. We present a model that attributes this behavior to a chain end retardation mechanism.

Jessica L. Carvalho  
Dept of Physics & Astronomy and the Brockhouse Institute for  
Materials Research, McMaster University, Hamilton, ON, Canada, L8S 4M1

Date submitted: 17 Dec 2009

Electronic form version 1.4