Abstract Submitted for the MAR08 Meeting of The American Physical Society

Statistics and dynamics of blends of linear and ring polymers. MICHAEL LANG, Leibniz-Institute for Polymer Research, MICHAEL RUBIN-STEIN, Department of Chemistry, University of North Carolina, 27599 Chapel Hill, N.C., USA — This work focuses on conformations and dynamics of blends of linear and ring polymers. Rings in a melt of homo-polymer rings are compressed due to topology, if rings are significantly larger than the entanglement length. Dilute rings with degree of polymerization, N_r , immersed in a melt of linear polymers with degree of polymerization, N_l are almost ideal if $N_l > N_r^{1/2}$ and swell if $N_l < N_r^{1/2}$. Dynamics of pure ring melts is enhanced as compared to pure linear melts. Thus, minority of linear chains immersed in ring melt experiences enhancement of diffusion and relaxation. On the other hand, minority of long entangled rings immersed in melt of long entangled linear chains gets temporarily trapped. This leads to a clear reduction in diffusion coefficient while keeping relaxation (as determined by half ring relaxation) almost unaffected.

> Michael Lang Leibniz-Institute for Polymer Research

Date submitted: 15 Nov 2007

Electronic form version 1.4