

Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Microphase Segregation in Organic-Inorganic Randomly Grafted Copolymers ENGIN BURGAZ , LEI ZHENG, GREGOIRE CARDOEN, E. BRYAN COUGHLIN, SAMUEL P. GIDO , Dep. of Polymer Science and Eng., Univ. of Massachusetts, Amherst — We have studied the microphase ordering of Polybutadiene-Polyhedral Oligomeric Silsesquioxane (PBD-POSS) randomly grafted copolymers using High Temperature Small Angle X-Ray Scattering and TEM. The polybutadiene forms the backbone of these copolymers whereas POSS cubic nanoparticles are grafted randomly along the backbone. In the bulk morphology, these molecules self-assemble due to the aggregation of the POSS nanoparticles and form randomly orientated two-dimensional lamellar sheets of POSS in the polybutadiene matrix. Our results show that the wave vector of the lamellar phase formed by these randomly grafted copolymers, has a temperature dependence different from either linear random copolymers or block copolymers. Our results are in consistent with the recently established randomly grafted copolymer mean-field theory and experiments.

Engin Burgaz
Dep. of Polymer Science and Eng., Univ. of Massachusetts, Amherst

Date submitted: 01 Dec 2004

Electronic form version 1.4