

W0321

Electric Field Induced Effects on the Microdomains in Concentrated Block Copolymer Solutions. Alexander Böker, Physikalische Chemie II, Univ. Bayreuth, 95440 Bayreuth, Germany.

We investigate the electric field induced orientation of diblock copolymer microdomains in concentrated solutions using Synchrotron SAXS. Recently, we have identified rotation of grains and nucleation and growth as the two governing mechanisms during microdomain orientation.^{1,2} Moreover, the dependence of the reorientation kinetics on the dielectric contrast of the blocks, the defect density as well as the electric field strength was investigated.^{3,4} More recently, the effect of the electric field on the polymer chains and on the block copolymer phase behavior has been studied. In this talk, we will show SAXS experiments elucidating the mechanisms and kinetics of block copolymer microdomain alignment. In addition, we will demonstrate the distinct influence of the electric field on the microphase, resulting in chain stretching and even phase mixing at sufficiently high field strengths.

References

- (1) Böker, A.; Elbs, H.; Hänsel, H.; Knoll, A.; Ludwigs, S.; Zettl, H.; Urban, V.; Abetz, V.; Müller, A. H. E.; Krausch, G. *Phys. Rev. Lett.* 2002, 89, 135501-135504.
- (2) Böker, A.; Elbs, H.; Hänsel, H.; Knoll, A.; Ludwigs, S.; Zettl, H.; Zvelindovsky, A. V.; Sevink, G. J. A.; Urban, V.; Abetz, V.; Müller, A. H. E.; Krausch, G. *Macromolecules* 2003, 36, 8078-8087.
- (3) Böker, A.; Schmidt, K.; Knoll, A.; Zettl, H.; Hänsel, H.; Urban, V.; Abetz, V.; Krausch, G. *Polymer* 2006, 47, 849-857.
- (4) Schmidt, K.; Böker, A.; Zettl, H.; Schubert, F.; Hänsel, H.; Fischer, F.; Weiss, T. M.; Abetz, V.; Zvelindovsky, A. V.; Sevink, G. J. A.; Krausch, G. *Langmuir* 2005, 21, 11974.