Martin-Luther-Universität Halle-Wittenberg
Naturwissenschaftliche Fakultät II
Chemie und Physik
SFB TR 102

POLYMER- UND SOFT-MATTER-KOLLOQUIUM

am Dienstag, dem 07.02.2012, 17.15 Uhr

VDP 1.27 Seminarraum Chemie, Von-Danckelmann-Platz 4,
06120 Halle

Es spricht: **Prof. Dr. rer. nat. habil. Andreas Schönhals**
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zum Thema:

" Structure-Property Relationships of Polymerbased Nano-composites: Interplay between Matrix and Interfacial Effects"

Abstract:

Different types of polymerbased nanocomposites (matrix materials: polyethylene, polypropylene, polycarbonate, polystyrene) with a broad variety of nanofillers (fillers: layered silica, layered doubled hydroxides, POSS) are prepared where the concentration of the particles is varied. TEM images show both an intercalated and exfoliated morphology in dependence on the nanofiller and the matrix. All systems are studied in detail by dielectric spectroscopy (DS) but also complementary methods like WAXS, SAXS, gas transport measurements, calorimetry, and FTIR spectroscopy are employed. Besides the dispersion, the interfacial region between the nanoparticles and the polymer matrix is crucial for the properties of the nanocomposites. Therefore attention is paid to investigate this interfacial area by DS because the polar groups of both the surfactant and compatibilizer are located close to the layers. For some systems it is found that the molecular mobility in the interfacial area is essentially higher than in the matrix. In addition a Maxwell/Wagner/Sillars polarization is found due to the blocking of charges at the layers. The time constant of this MWS-process can be correlated with characteristic length scales in the nanocomposites and provides information about the dispersion of the nanofiller.