

Nanocomposites composed of HEUR polymer and magnetite iron oxide nanoparticles: Structure and dynamics

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We study nanocomposites consisting of a polymer matrix which consists of hydrophobically modified ethoxylated urethane polymers (HEUR) with embedded coated magnetite nanoparticles. Two different kinds of coatings are compared namely the hydrophobic coating, composed of oleic acid and oleylamine, and the hydrophilic coating composed of a cationic surfactant, C18TAB, as an additional layer to the hydrophobic magnetic nanoparticles. We focused on the structural characterization through small angle neutron scattering (SANS) measurements of such nanocomposites in two different morphologies: as thin dry films and as hydrogels. We also performed magnetic response measurements on the nanocomposites in the dried state. In order to have information about the dynamics, and both electrical and mechanical properties of the nanocomposites in the dried state, we performed dielectric spectroscopy measurements.

Primary author: Ms CAMPANELLA, Antonella (JCNS@FRMII)

Co-authors: Dr BRÁS, Ana Rita (JCNS@FRMII); Prof. RICHTER, Dieter (JCNS@FRMII); Dr FRIELINGHAUS, Henrich (JCNS@FRMII); Prof. PADUANO, Luigi (Dipartimento di Scienze Chimiche, University of Naples "Federico II"); Dr APPAVOU, Marie Sousai (JCNS@FRMII); Prof. MÜLLER-BUSCHBAUM, Peter (Technische Universität München, Physik-Department, Lehrstuhl für Funktionelle Materialien); Dr DI, Zhenyu (JCNS@FRMII)

Presenter: Ms CAMPANELLA, Antonella (JCNS@FRMII)

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