

Abstract Submitted  
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**Polymer Morphology and Crystallinity close to Inorganic Surfaces** KIRIAKI CHRISSOPOULOU, HELLEN PAPANANOU, SPIROS H. ANASTASIADIS, FORTH-IESL and Univ. of Crete, KONSTANTINOS S. ANDRIKOPOULOS, GEORGE A. VOYIATZIS, FORTH-ICEHT — Polymer behavior close to surfaces or when restricted in space can be very different from that in the bulk. In this work, we investigate the morphology, crystallization and chain conformation of a hydrophilic, semi-crystalline polymer, poly(ethylene oxide), PEO, when mixed with silica, SiO<sub>2</sub>, nanoparticles in a broad range of compositions. The good dispersion of the nanoparticles was verified by Transmission Electron Microscopy (TEM), whereas the morphology and crystallization behaviour of the hybrids were investigated with, X-ray Diffraction (XRD), Fourier Transform Infrared Spectroscopy (FTIR) and Differential Scanning Calorimetry (DSC). A gradual decrease of polymer crystallinity with increasing nanoparticles content is observed; nevertheless, polymer crystallization exists for all silica loadings. Moreover, DSC showed two melting and crystallization transitions in hybrids with polymer content lower than 50wt%, indicating that the polymer crystallizes differently than the bulk when it is in a thin interfacial layer near the silica surface. The existence of the two transitions are also evident in the IR and Raman spectra. Partially sponsored by EU (COST Action MP0902) and by the Greek GSRT (Research Funding Program: ARISTEIA II (SMART-SURF, project No. 3393, 2013SE01380048).

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