

Abstract Submitted
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Crystallization kinetics in poly(ethylene oxide) / layered silicates nanocomposites ELENI PAVLOPOULOU, SAPFO FOTIADOU¹, ELENI PAPANANOU¹, KIRIAKI CHRISOPOULOU, SPIROS H. ANASTASIADIS, Foundation for Research and Technology-Hellas and University of Crete, Heraklion Crete, Greece, GIUSEPPE PORTALE, WIM BRAS, ESRF-DUBBLE, Grenoble, France — We investigate the effect of inorganic clay on the crystalline characteristics and the crystallization kinetics of PEO in its intercalated nanocomposites with natural montmorillonite (Na⁺- MMT). The structure of the hybrids was investigated over multiple length scales by X-ray diffraction, small-angle X-ray scattering (SAXS) and polarizing optical microscopy (POM) as well as by DSC. The PEO within the galleries is completely amorphous whereas only the excess polymer outside the completely full galleries can crystallize at high PEO concentrations. The time resolved measurements reveal the effect of clay on crystallization. Even very small amount of the inorganic can cause a significant decrease of the spherulite size. The crystallization mechanism varies from sporadic nucleation for pure PEO to two-dimensional growth with predetermined nuclei at 10wt% clay with a higher activation barrier for low clay concentration. Sponsored by NATO's Scientific Affairs Division, by the Greek GSRT and by the EU.

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