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**Crystallization in polymer nanocomposites** KYRIAKH CHRIS-  
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Polymer crystallization is a very interesting topic since it is responsible for the final  
properties of the materials. On the other hand, addition of inorganic nanomaterials  
has been recently widely used to optimize polymer properties. In this work, the  
effect of the presence of surfaces and of the severe confinement on polymer morphol-  
ogy and crystallization are investigated in hydrophilic nanohybrids of poly(ethylene  
oxide) and silica nanoparticles of different sizes; hybrids with different ratios of the  
two kinds of nanoparticles were synthesized as well, to achieve the highest confine-  
ment. Differential Scanning Calorimetry (DSC) and X-Ray Diffraction (XRD) were  
utilized to investigate the behavior and showed that the polymer chains that were  
able to crystallize showed a different crystalline behavior in the hybrids with lower  
 $T_m$  and lower crystallinity. Under severe confinement polymer crystallization was  
completely suppressed. Moreover, the crystallization kinetics was investigated with  
Isothermal Polarized Optical Microscopy (POM) and Isothermal Differential Scan-  
ning Calorimetry (DSC) showing different characteristics in the hybrids compared  
to that of the neat polymer depending on the silica content. Sponsored by the Greek  
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