Polymers have found numerous applications in various fields during the last century and contributed substantially to enhance the living standard of mankind. After the introduction of nanotechnology they gained also importance in conjunction with many nanomaterials in the form of nanocomposites and their applications. Nanomaterials have been recently in the focus as an interesting class of new materials with many applications. The use of different types of nanomaterials such as nanoparticles and nanotubes allows designing and developing new concepts for sophisticated applications. Recently, polymers have been also investigated as a tool for the dispersion of nanomaterials. When introducing nanomaterials into the biosphere, the dispersion in water is particularly important. Several model systems with carbon and inorganic nanotubes have been studied and examples of their interaction products and composites are given in terms of their interactions with biological cells in the cellular interphases. In this regard, the concept of the interphase is introduced and explained based on the different dimensionality aspects.
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