

Carbon Nanotube-Polymer Composites: Effect of Nanotubes on Polymer Physics

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Carbon nanotubes are in many ways similar to polymers. Both molecules have contour lengths typically on the order of 1 micron, and, for single-walled tubes, diameters between 0.5 and 1 nm. In terms of physics, the significant difference between the two is the significantly larger inflexibility of a nanotube, which is quantified by an orders-of-magnitude larger persistence length. This talk will describe how nanotube and polymer physics interact with one another in composites of the two materials. While the talk will focus on work done in the author's lab, important studies done by others will also be discussed. The author will also briefly discuss how these physics affect commercial products that contain nanotubes and finally discuss the challenges that still remain in this area.