

Abstract Submitted  
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**The Impact of Fullerenes on the Ordering of Polyacrylonitrile in Nanocomposites**<sup>1</sup> ADAM IMEL, MARK DADMUN, Department of Chemistry University of Tennessee — The presence of nanoparticles can impact the crystallization and ordering of polymer chains in a nanocomposite. We have found that certain fabrication conditions of polyacrylonitrile (PAN) and fullerenes, as well as PAN and SWNTs, produce a SAXS peak. This SAXS peak is similar to a microphase separation peak and indicates a self-assembly of the nanocomposite on a length scale of  $\sim 150$  Å. In order to identify the origin of this peak, we have completed dynamic light scattering, viscosity, small angle x-ray scattering and wide-angle x-ray scattering experiments to characterize the dispersion of C60 in solution and in the final solid nanocomposite. These results support a completely miscible solution. The interpretation of the SAXS & WAXS results suggest that the addition of C60 directs the crystallization of PAN in the final nanocomposite by dramatically decreasing the amount of crystallinity while also affecting the packing structure and limiting the size of the PAN crystals.

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