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Polymer Conformations in SWCNT/Polystyrene Nanocomposites using SANS[1] WEI-SHAO TUNG, University of Pennsylvania, NIGEL CLARKE, University of Sheffield, RUSSELL J. COMPOSTO, KAREN I. WINEY, University of Pennsylvania — Polymer conformations are a critical factor that affects the performance of polymer nanocomposites. Using small angle neutron scattering, we probe chain conformations and confinement of polymers in SWCNT/polystyrene nanocomposites. We established the contrast matching criteria by measuring nanocomposites with different dPS:PS ratios (79:21 to 63:37) for two different SWCNT loadings and found the best ratio of dPS:PS (72.5:27.5) which gives us a similar scattering strength as SWCNT. Therefore, the scattering signal from SWCNT are screened and contribute little to the total scattering intensity. By making contrast matched samples, we are able to focus on the scattering intensity from polymer chains and determine Rg by fitting the intensity data. We found that the Rg of the polymer chain increases weakly with 1 wt% ($< 5\%$) nanotube and then strongly ($>25\%$) with 3 wt% nanotube, while the chain conformation still follows Gaussian statistics.

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