Characterization of Polystyrene Soft Nanoparticles Using Small Angle Neutron Scattering[1] HALIE MARTIN, Univ of Tennessee, Knoxville, TYLER WHITE, TOMONORI SAITO, Oak Ridge National Lab, MARK DADMUN, Univ of Tennessee, Knoxville — Polymer nanocomposites have become a prominent area of research recently. With a growing variety of nanoparticles available, research probing the influence of particle morphology on the overall nanocomposite properties is also increasing. Nanoparticle dispersion is controlled by both the chemical nature and morphology of the nanoparticle where a crosslinked, fuzzy organic nanoparticle is anticipated to enhance the overall miscibility and create a homogenous dispersion within a like-polymer matrix. A semi-batch microemulsion polymerization forms organic, soft nanoparticles where the precise structure of the nanoparticle is controlled by monomer rate of addition and crosslinking density. We will report small angle neutron scattering results that correlate synthetic conditions to the structural characteristics of soft nanoparticles. This analysis provides characterization of the individual nanoparticle molecular weight, the radius of the crosslinked core, the thickness of the fuzzy interfacial layer, and provides insight into the overall topography of the soft nanoparticle. This research provides a pathway to investigate the effect of nanoscale structural features of the nanoparticle on their individual properties and those of nanocomposites that contain these soft nanoparticles.

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