Revealing Deformation Mechanisms in Polymer Grafted Thermoplastic Elastomers via In Situ Small-Angle X-Ray Scattering

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1. SAXS Fitting

![Figure S1](image)

Figure S1. 1D SAXS plots with a spheroid form factor and a hard sphere structure factor derived from the Percus-Yevick approximation fit for the (a, b) undeformed and (c, d) strained neat SBS sample ($\phi_{SBS} = 100\%$) in $q_x$ and $q_y$ directions. 1D SAXS plots for undeformed neat SBS samples in the (a) $q_x$ and (b) $q_y$ directions. 1D SAXS plots for strained neat SBS samples in the (c) $q_x$ ($\varepsilon = 130\%$) and (b) $q_y$ ($\varepsilon = 150\%$) directions.
Figure S2. A plot indicating the change in scatterer size (i.e., PS sphere) with respect to strain in $q_x$ and $q_y$ directions for the neat SBS sample ($\phi_{\text{SBS}} = 100\%$). The scatterer size values and standard deviations were determined from the SAXS fits.
2. $^1$H NMR

Figure S3. $^1$H NMR spectra of the dried, neat SBS sample ($\phi_{SBS} = 100\%$) after dog bone formation. The neat SBS dog bone sample was dissolved in CDC13. The THF wt% in the sample, calculated from the integration values (e.g., of PS (6.3 – 7.2 ppm), PBD (5 ppm, 5.5 ppm), and THF (3.7 ppm)), was calculated to be less than 1 wt%.