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Revised submission to Macromolecules – ***Supporting Information***

Dispersion, Depletion, and Bridging of Athermal and Attractive Nanorods in Polymer Melt.

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Supporting Information

As discussed in the main text, and illustrated by Figure 11, attractive rods of larger diameters and longer aspect ratios prefer bridging aggregation to contact aggregation. It is worthwhile to ask whether this is due to the fact that the range of attraction between rods scales with rod diameter ($\alpha_{nn} = 0.1D$). Figure SI1, illustrates the nanorod-nanorod radial distribution function for a polymer-rod composite with rod aspect ratio=4, $D/d = 4$, and $\varepsilon_{nn}/\varepsilon_{pn} = 2$, at varying attraction ranges. The figure shows the bridging behavior when $\alpha_{nn} = 0.1D = 0.4d$, but also that the bridging correlations persist when the attraction range is reduced to $\alpha_{nn} = 0.0825D = 0.33d$, and $\alpha_{nn} = 0.05D = 0.2d$. As indicated by Figure 11b, rods with $D/d = 2$ ($\alpha_{nn} = 0.1D = 0.2d$), prefer contact aggregation to bridging aggregation. Hence, it is not the range of attraction between rods, rather the thickness of the rods, relative to monomer diameter, that determines whether they prefer contact or bridging aggregation at the high ε_{pn} boundary.

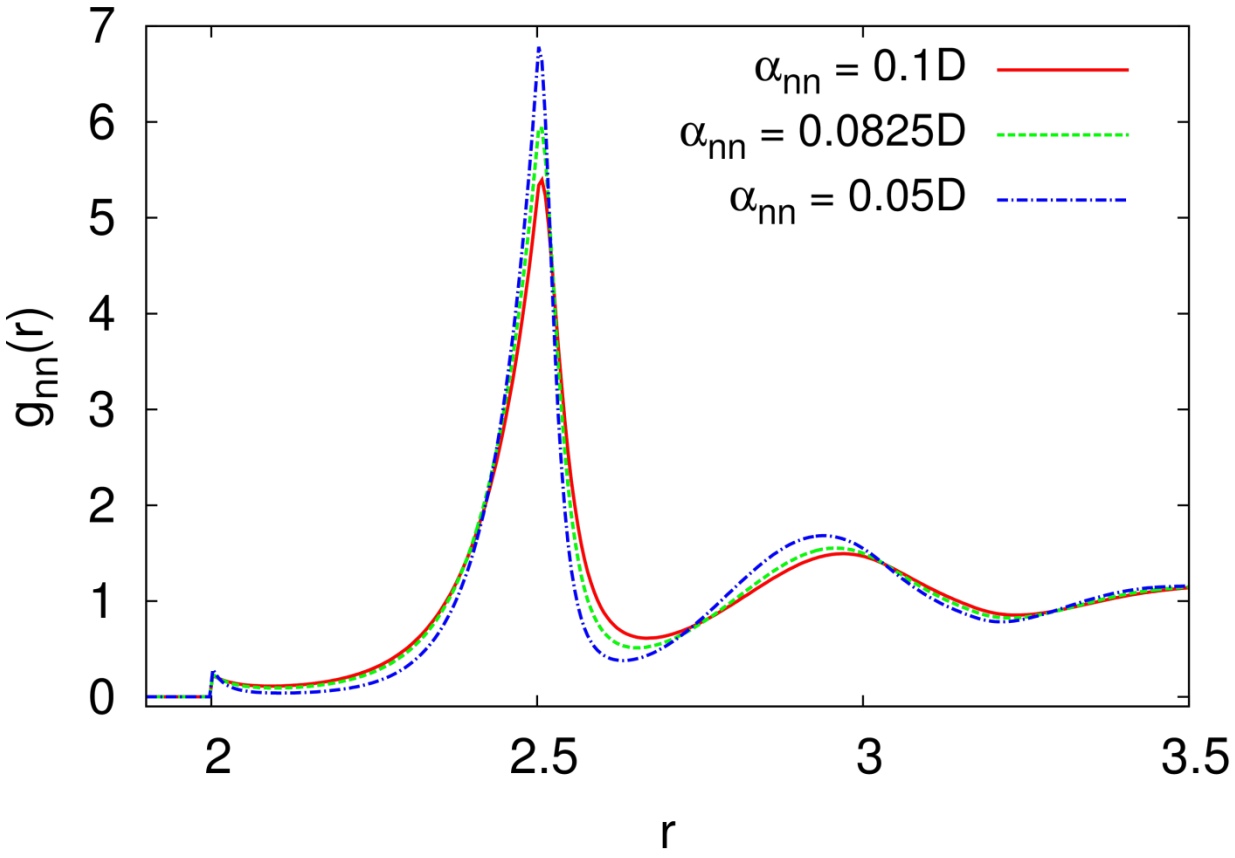

Figure SI1

Rod-rod radial distribution function in the bridging regime for attractive nanorods with $\varepsilon_{nn}/\varepsilon_{pn}=2$, $AR=4$, $D/d=4$ at various nanorod-nanorod attraction ranges – $\alpha_{nn}=0.1D=0.4d$ (solid, red line), $\alpha_{nn}=0.0825D=0.33d$ (dashed, green line), and $\alpha_{nn}=0.05D=0.2d$ (dot-dashed blue line).