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Crystallization of Hybrid Polymer Systems STEPHEN Z. D. CHENG, University of Akron, RYAN M. VAN HORN, WENBIN ZHANG, XINFEI YU, CHIEN-LUNG WANG, HAO-JAN SUN — Our goal is to understand how to incorporate nanoparticles into materials for significant technological advancements by relating physical properties to the ordered microscopic structure. In our group, we have developed an efficient way to synthesize polymer conjugates using C₆₀-fullerenes and POSS. By designing new molecular building blocks and using polymer self-assembly (crystallization, microphase separation, specific hydrogen bonding, and $\pi - \pi$ and other interactions), ordered structures of modified nanoparticles were assembled in the bulk and at the interface. In this talk, an example of crystallizable polymers that have been capped with these particles will be discussed as it pertains to forming 2D sheets on the basal surfaces of single crystals. These materials are capable of crystallizing in solution, enabling the formation of highly conducting or insulating sheets on the basal surfaces of the crystals. The effect of these incompressible particles on the crystallization of the polymer block was studied.

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