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Fluorinated Polyhedral Oligomeric Silsesquioxane Based Giant Molecular Shape Amphiphiles: Hierarchical Self-Assembly with Unusual Chain Conformation XUE-HUI DONG, University of Akron, BO NI COLLABORATION, ZIRAN CHEN COLLABORATION, YIWEN LI COLLABORATION, WEN-BIN ZHANG COLLABORATION, STEPHEN Z.D. CHENG COLLABORATION — The fluorous phase has thus been considered as the third phase that repels both oil and water due to its ultra-low surface energy. Incorporation of fluorinated component into hydrophilic/hydrophobic polymers is anticipated to bring novel self-assembly behaviors in the bulk, solution and thin film states, which are not only academically intriguing but also technological relevant. Among them, fluorous molecular clusters are of particular interest. A topologic isomer pair of giant molecular shape amphiphiles can be constructed by tethering molecular nanoparticle at different location of block polymers. In this study, a fluorinated polyhedral oligomeric silsesquioxane (FPOSS) was precisely fixed onto polystyrene*block*poly(ethylene oxide) (PS-*b*-PEO) at chain end (FPOSS-PS-*b*-PEO), or junction point [PS-(FPOSS)-PEO]. The interplay between nanoparticle and block polymers results in hierarchical structures with three types of order. The incommensuration of cross-sectional area between FPOSS and block polymer stretches polymer chains, which found to enhance the immiscibility between PEO and PS block.

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