

Abstract Submitted
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Hierarchal **Ordered**
Structures in Hybrid Functional Supramolecules and Macromolecules¹

STEPHEN CHENG, WEN-BIN ZHANG, CHIEN-LUNG WANG, XINFEI YU, YI-WEN LI, XUEHUI DONG, RYAN VAN HORN — To create new functional materials for advanced technologies, control over their hierarchical structure and order is vital for obtaining the desired properties. We utilized and functionalized fullerene (C₆₀) and polyhedral oligomeric silsesquioxane (POSS), and assembled both of these particles with polymers to form those hierarchical structures. In order to do so, we have developed a novel way of attaching C₆₀ and POSS onto other organic materials in a highly efficient and controlled manner via “click” chemistry. The structure of this assembly along with the resulting ordered structures were analyzed to determine their structure-property relationships. Examples are materials of POSS-[60]Fullerenoacetate conjugate crystals, giant surfactant of polystyrene-(carboxylic acid-functionalized polyhedral oligomeric silsesquioxane) amphiphile and porphyrin-C₆₀ hybrids for intra- and inter-columnar in supramolecular double cable structures.

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