

Abstract Submitted  
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**Hybrid Thin Films Based Upon Polyoxometalates-Polymer Assembly** NA QI, BENXIN JING, YINGXI ZHU, University of Notre Dame — Block copolymers (BCPs) and polyoxometalates (POMs) have been used individually as building blocks for design and synthesis of novel functional materials. POM nanoclusters, the assemblies of transition metal oxides with well-defined atomic coordination structure, have been recently explored as novel nanomaterials... for catalysis, semiconductors, and even anti-cancer treatment due to their unique chemical, optical and electrical characteristics. We have explored the blending of inorganic POM nanocluster with BCPs into hierarchically structured inorganic-organic hybrid nanocomposites. Using polystyrene-*b*-poly(ethylene oxide) (PS-*b*-PEO) thin films as the template, we have observed that the spatial organization of BCP thin films is modified by molybdenum based POM nanocluster to form 2D in-plane hexagonal ordered or 3D ordered network of POM-BCP assemblies, depending on the concentration ratio of POM to PS-*b*-PEO. The dielectric properties of such hybrid thin films can be enhanced by embedded POMs but show a strong dependence on the supramolecular structures of POM-polymer complexes. The assembly of nanoclusters in BCP-templated thin films could pave a new path to design new hybrid nanocomposites with uniquely combined functionality and material properties.

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