

Supramolecular dendrimer building block for sub-5nm patterning

권기옥[†]

한국생산기술연구원

(kioks@kitech.re.kr[†])

Supramolecular dendrimer has numerous advantageous properties for new building block for bottom-up lithography approaches, associated with their small feature size (sub-5nm), short stabilization times required to produce highly ordered structures, and flexible functionalities and structures. In spite of the great advances in the field, it is very difficult to generate large-area single domain ordering using supramolecular dendrimer because of their complex architectures and multiple site for intermolecular interactions. This stands as a major hurdle for wide spread application of dendrimer materials. In the study, we report a simple and general method to create ultra-dense, single domain arrays of dendrimer cylinders (ca. 4.5 nm diameter) over large areas (0.3 mm x 0.3 mm) by utilizing sandwich system. We also demonstrate for the first time use of a supramolecular dendrimer assembly for the formation of a highly ordered nanoparticle array with a high areal density of ~20 Tdot/in². We believe that the observations made in this effort should serve as the foundation for the design of new routes for bottom-up lithography based on dendrimers.