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Directed self-assembly with density multiplication of block copolymer via controlled solvent annealing MIKIHITO TAKENAKA, Kyoto University, HIROSHI YOSHIDA, YASUHIKO TADA, Hitachi Ltd., TERUAKI HAYAKAWA, YOSHIHITO ISHIDA, Tokyo Institute of Technology, HIROKAZU HASEGAWA, GO SAKAGUCHI, KINICHIRO YAMAGUCHI, Kyoto University — We report density multiplication of chemically patterned template employing highly segregating polyhedral oligomeric silsesquioxane (POSS) containing block copolymer (PMMA-b-PMAPOSS) for extending the technique to smaller dimensions than that attained by PS-b-PMMA. PMMA-b-PMAPOSS which self-assembles into hexagonally closed packed (hcp) array of dots with lattice spacing $d=13\text{nm}$ was spin coated on the chemical template with doubled hcp lattice spacing $d=26\text{nm}$, and annealed under controlled CS_2 atmosphere. By tuning the swell ratio of PMMA-b-PMAPOSS, ordered array of dots with $d=13\text{nm}$, which correspond to $3.5\text{Tbit}/\text{in}^2$ was obtained by multiplying pattern density of the chemical template in a factor of 4. This work was supported by New Energy and Industrial Technology Development Organization, Japan.

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