Perpendicularly oriented nanostructures by using star-shaped poly(methyl methacrylate)-block-polystyrene thin film
SANGSHIN JANG, KYUSEONG LEE, HONG CHUL MOON, JICHEOL PARK, JONGHEON KWAK, GUMHYE JEON, JIN KON KIM, Pohang Univ of Sci & Tech — Thin films of star-shaped 18-arm poly(methyl methacrylate)-block-polystyrene copolymers ((PMMA-b-PS)$_{18}$) with two different volume fraction of PS block ($f_{PS}$) (0.60 and 0.75). Interestingly, perpendicularly oriented lamellar and cylindrical structures were confirmed by atomic force microscopy (AFM) and grazing-incidence small angle X-ray scattering (GISAXS), after thermal annealing without additional treatment such as random copolymer treatment or solvent annealing. Perpendicularly oriented nanostructures were also achieved for versatile substrates such as PS(or PMMA)-brushed substrate, flexible substrate (PEN) or gold-deposited substrate.

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