Supporting Information for :

Epitaxial Phase Transition between Double Gyroid and Cylinder Phase in Diblock Copolymer Thin Film

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Phase transition from DG to HEX in SI-3 thin film

To offer evidence on the new epitaxial relationship, the grain boundary generated during transformation from DG to HEX was further confirmed in SI-3 (M_n = 29,400, M_w /M_n = 1.01, f_{PI} = 0.670) thin film. DG was first developed at 140°C for 24 h and subsequently increase temperature to HEX window, 190°C for 2 h. SI-3 thin film exclusively showed the type A epitaxy where cylinders are perpendicularly connected with $\{220\}_{DG}$. This result accords well with that in SI-2 thin film during the DG to HEX transition.

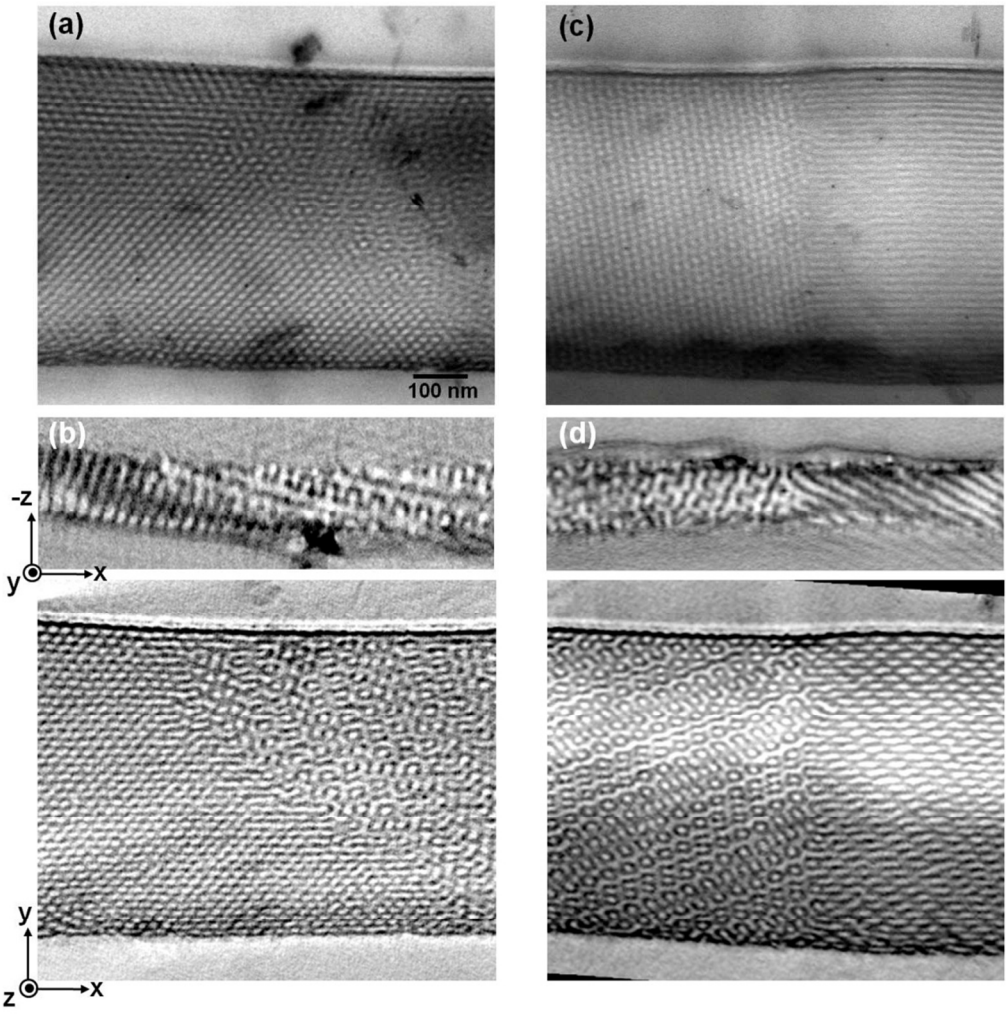

Figure S1. Digitally sliced images of phase transition from DG to HEX in SI-3 thin film. (a) and (b) are observed at different spots in the same specimen.

Transition intermediate from DG to HEX in epitaxy A

Figure S2 displays a 3D reconstructed image of the grain boundary showing the type A epitaxial transition from DG to HEX. There are two kinds of aspect induced from distortion during phase transition. According to the phase transition mechanism described above, the cylinder marked by an asterisk (*), should connected directly with the fragment of DG marked by (*') and ①' shows disconnected DG skeleton from the complete one (①) to form a cylinder.

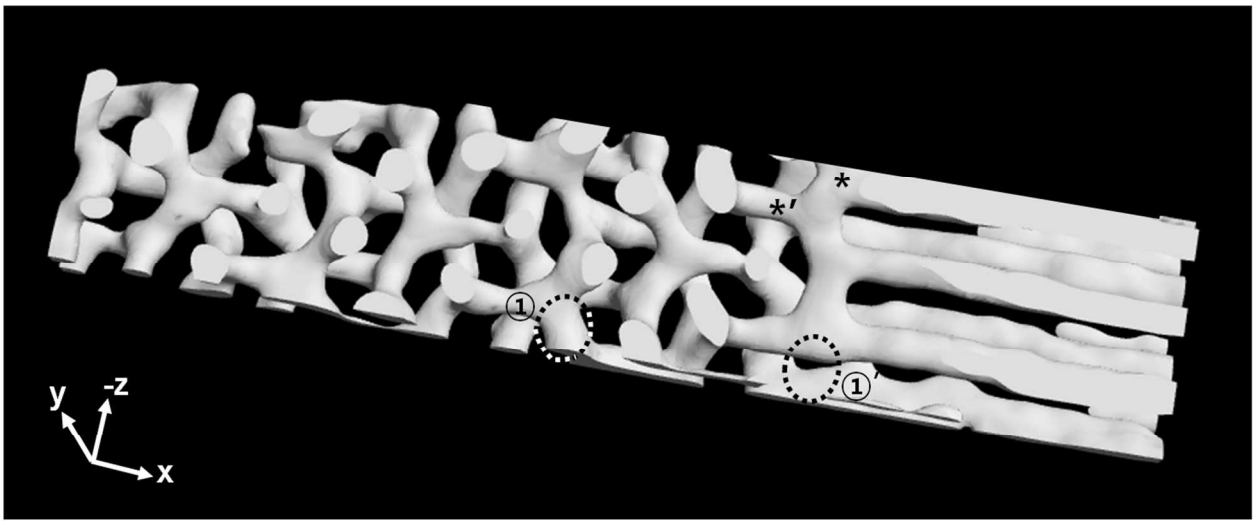

Figure S2. 3D reconstructed image (x : y : z = 420 : 40 : 90 nm) in transitional region showing the distortion in the type A epitaxial transition from DG to HEX. The cylinder marked by * is dislocated from the position of the DG tripodal fragment (*') which converts to a cylinder. And ①' shows a disconnected DG tripodal arm from an intact tripod (①) to form a cylinder.

Supplementary Movies

3D movies of Figure 5b and Figure 9b are provided as MPEG video.