

## Supporting Information for

# Selective Sequential Infiltration Synthesis of ZnO in Liquid Crystalline Phase of Silicon-containing Rod-Coil Block Copolymers

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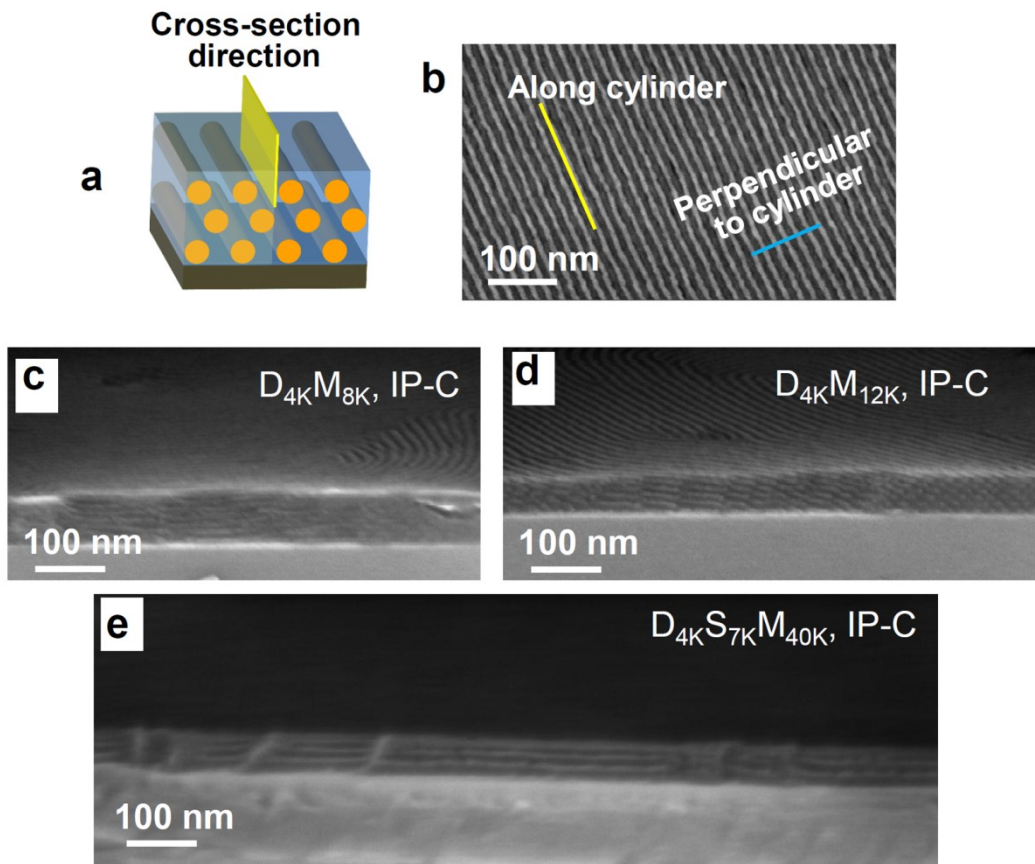
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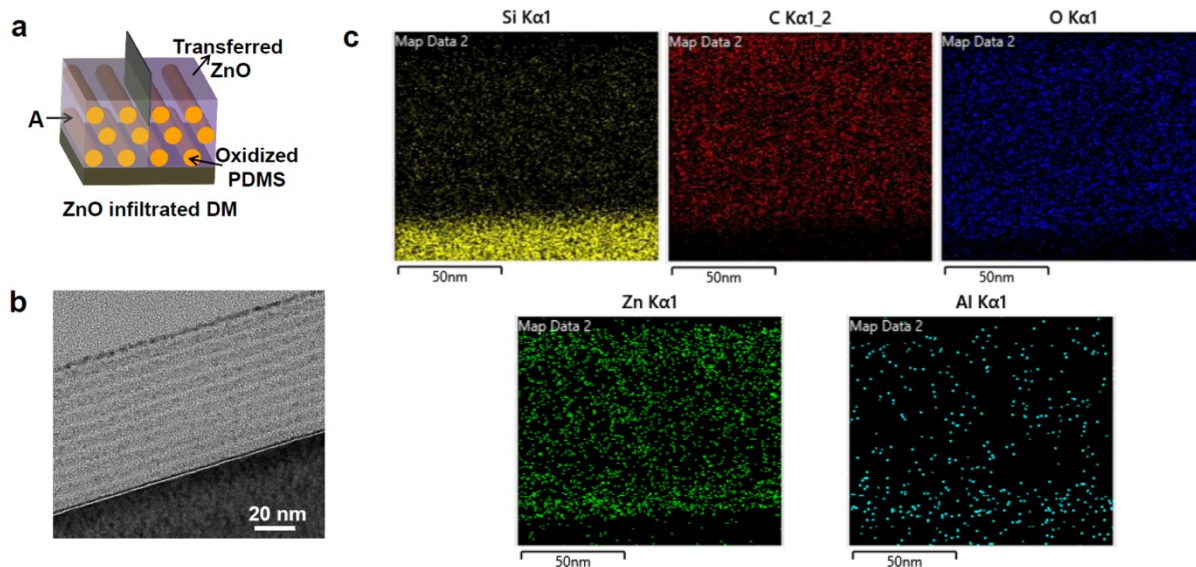
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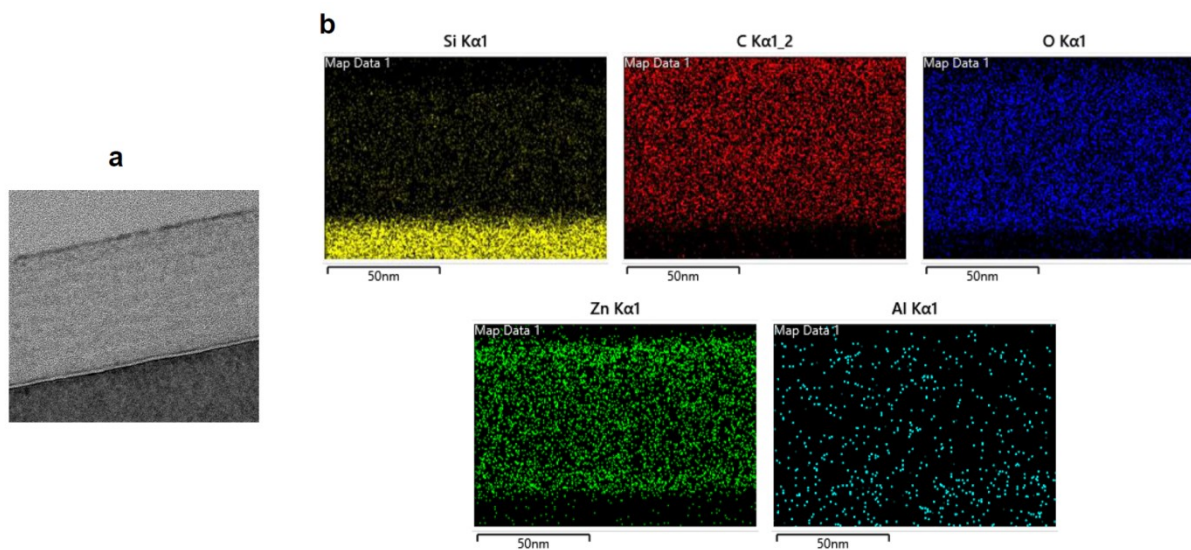
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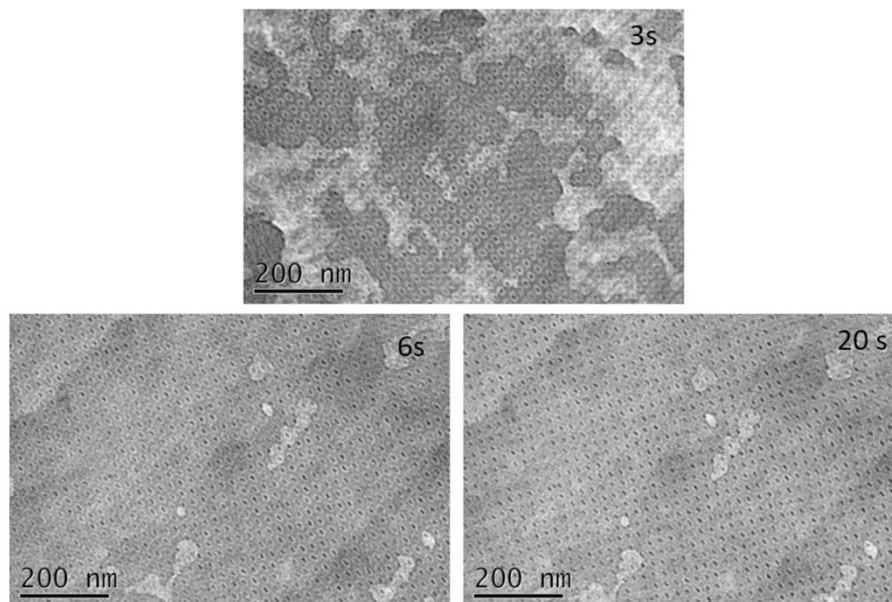
**Figure S1.** (a) Schematic illustration of in-plane cylinders and the plane of the cross-section (yellow) along the cylinders. (b) top-view SEM image with indication of the cross-section directions parallel (yellow line) and perpendicular (blue line) to the cylinders. Representative cross-section SEM images approximately parallel to the in-plane cylinders for (c)  $D_{4K}M_{8K}$ , (d)  $D_{4K}M_{12K}$  and (e)  $D_{4K}S_{7K}M_{40K}$ .



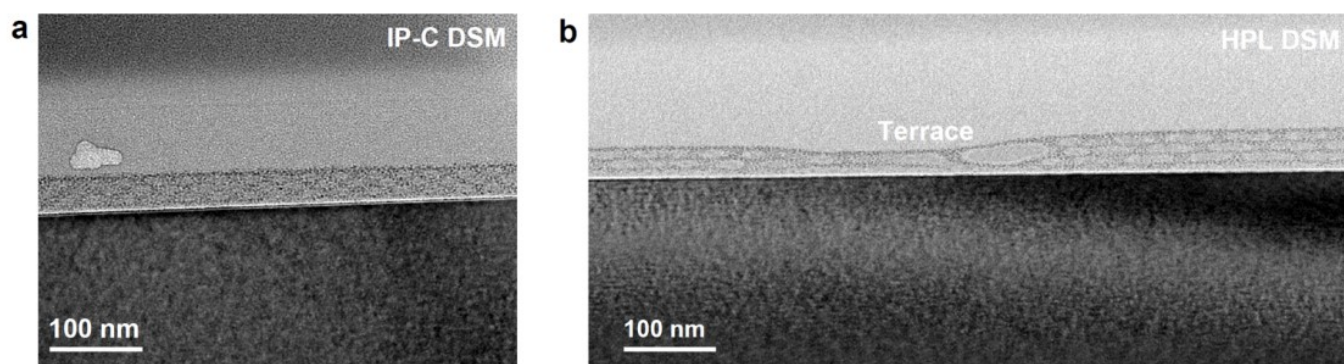
**Figure S2.** (a) Schematic illustration of in-plane cylinders of  $D_{4K}M_{8K}$  and the cross-section along the cylinder (plane A). (b) Bright-field TEM image of the cross section along the cylinders; (c) EDS mapping images of elements.



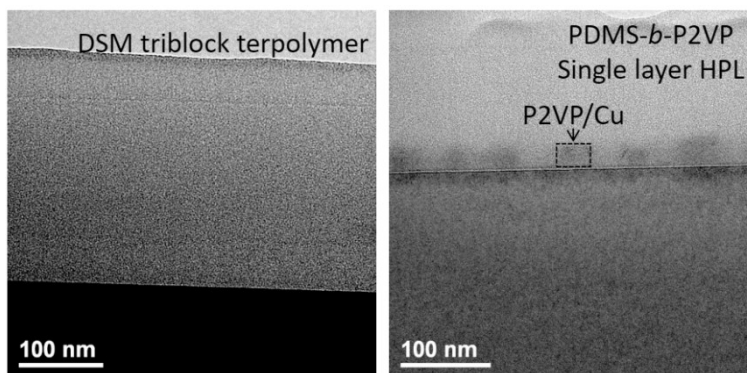
**Figure S3.** (a) Bright-field TEM image of the cross section along the cylinders, and (b) EDS elemental mapping images of  $D_{4K}M_{12K}$ .



**Figure S4.** TEM images of a bulk PDMS-*b*-PS-*b*-PMPCS triblock terpolymer without infiltration, which formed a core-shell spherical structure. The three images were taken after different exposures under the electron-beam spot: 3 s, 6 s and 20 s. The dark microdomains are the PDMS cores, the bright shells are PS and the grey matrix is the PMPCS. Increasing electron beam exposure degrades the polymer and reduces the contrast between PS and PMPCS.



**Figure S5.** Cross-section bright-field TEM images of (a) in-plane cylindrical  $D_{4K}S_{7K}M_{40K}$  and (b) perforated lamellar  $D_{4K}S_{7K}M_{40K}$  after infiltration of ZnO. A terrace is seen in the perforated lamellar  $D_{4K}S_{7K}M_{40K}$ .



**Figure S6.** The bright-field TEM images of liquid phase Cu infiltration in thin films of an HPL PDMS-*b*-PS-*b*-PMPCS triblock terpolymer (left) and a HPL PDMS-*b*-P2VP block copolymer (right). There was no evidence of Cu infiltration in the DSM, but in the PDMS-*b*-P2VP the Cu enters the P2VP matrix and gives darker contrast.