Supporting Information

Ultra-Large Pore Mesoporous Carbons Templated from Poly(ethylene oxide)-*b*-Polystyrene Diblock Copolymer by Adding Polystyrene Homopolymer as a Pore Expander

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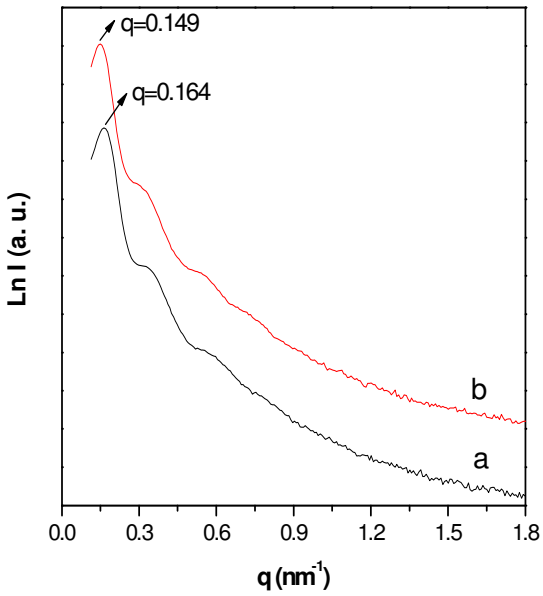

Figure S1. SAXS patterns of (a) LP-FDU-18-25-450 and (b) LP-FDU-18-35-450 prepared by adding excessive *h*-PS_{49} (25 and 35 wt%, respectively) after pyrolysis at 450 °C in N_2.

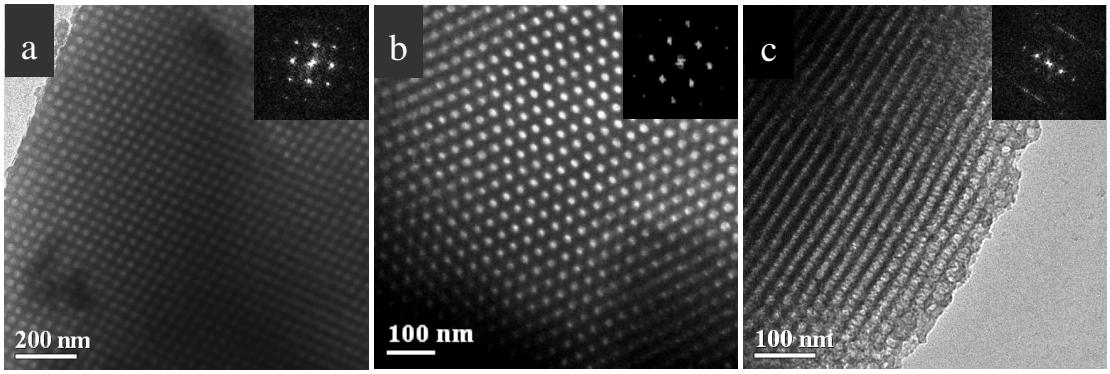

Figure S2. TEM images of LP-FDU-18-0-800 sample prepared without adding *h*-PS_{49} viewed from (a) 100, (b) 110 and (c) 211 directions. The insets show the corresponding FFT diffractometers.

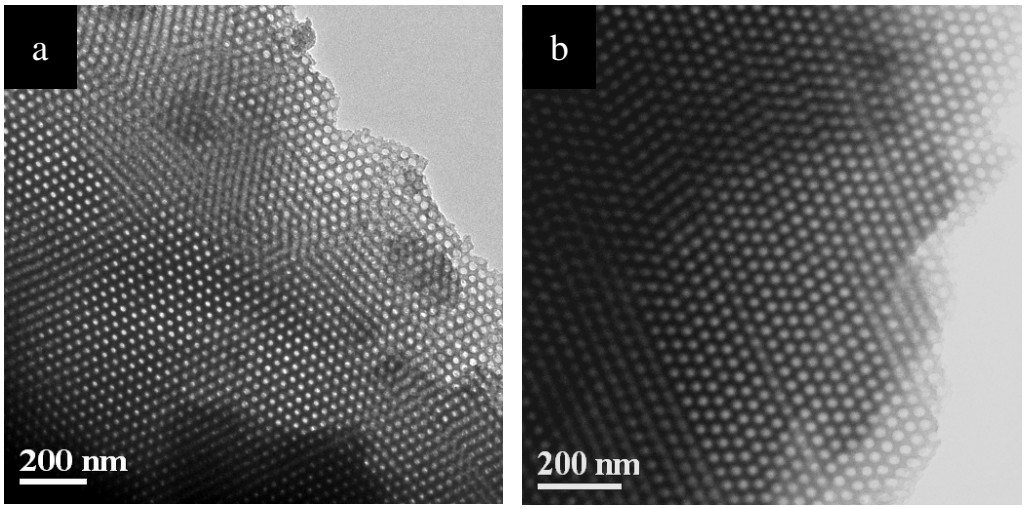

Figure S3. TEM images of FDU-18-20-800 sample prepared by adding 20 wt% *h*-PS_{49} as pore expander after carbonization at 800 °C under N_2, indicating the existence of structure defects.

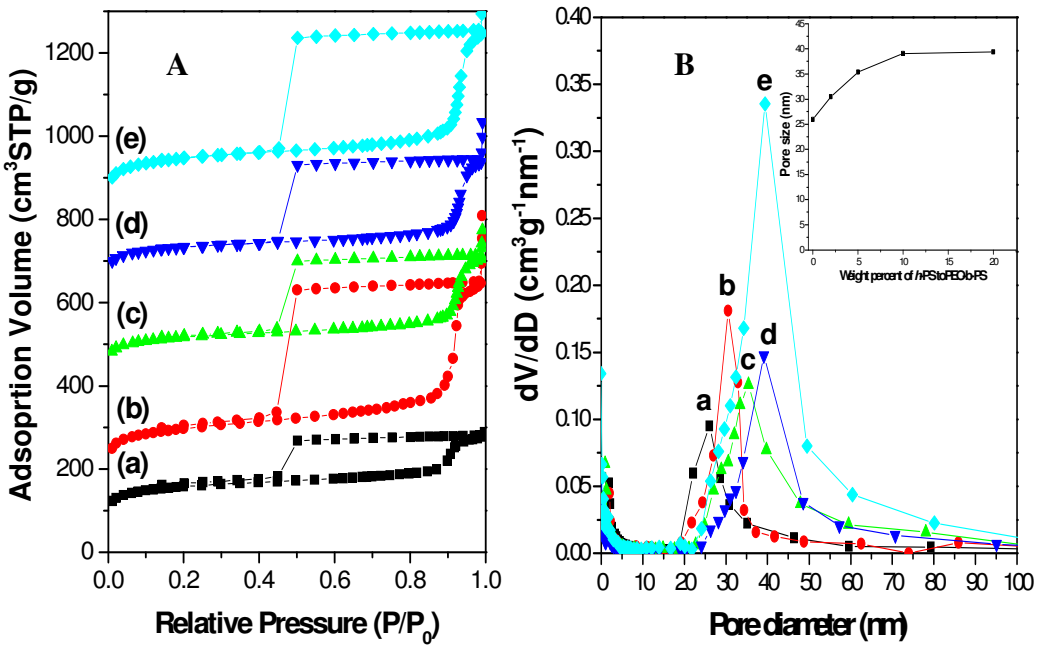

Figure S4. (A) N_2 isotherms and (B) pore size distribution of (a) LP-FDU-18-0-450, (b) LP- FDU-18-2-450, (c) LP-FDU-18-5-450, (d) LP-FDU-18-10-450 and (e) LP-FDU-18-20-450. The N_2 isotherms of b, c, d and e are offset vertically by 100, 300, 500 and 700 cm^3/g, respectively. The inset shows the pore size changes of the LP-FDU-18-450 samples upon the increase of *h*-PS_{49} addition amount.

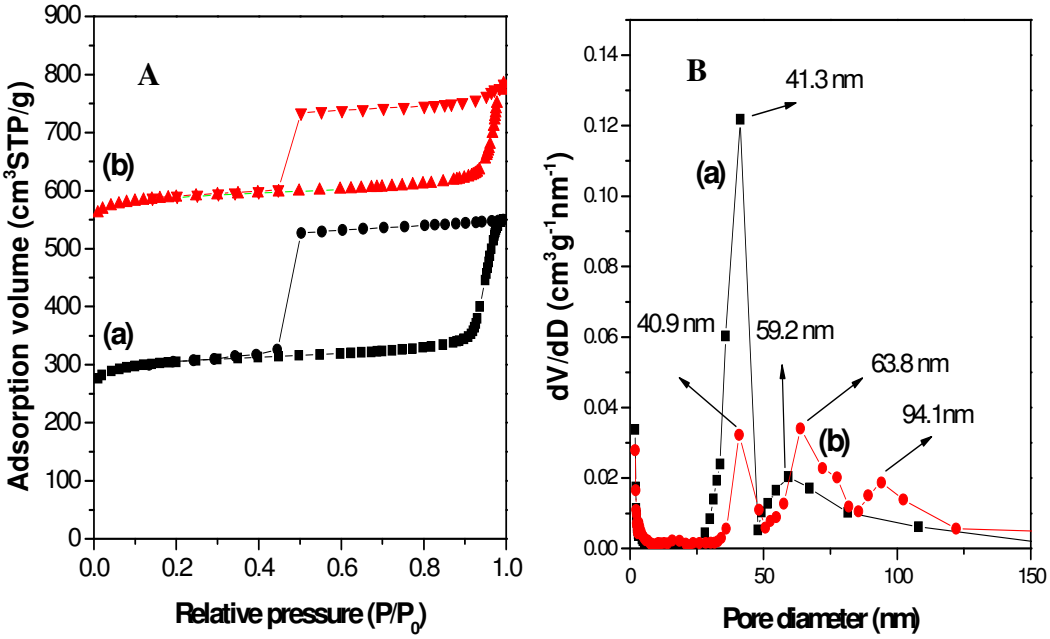

Figure S5. (A) N_2 isotherms and (B) pore size distribution of (a) LP-FDU-18-25-800, (b) LP-FDU-18-35-800 prepared by adding excessive *h*-PS_{49} (25 and 35 wt%, respectively) after carbonization at 800 °C under N_2. The N_2 isotherms of b are offset vertically by 300 cm^3/g, respectively.

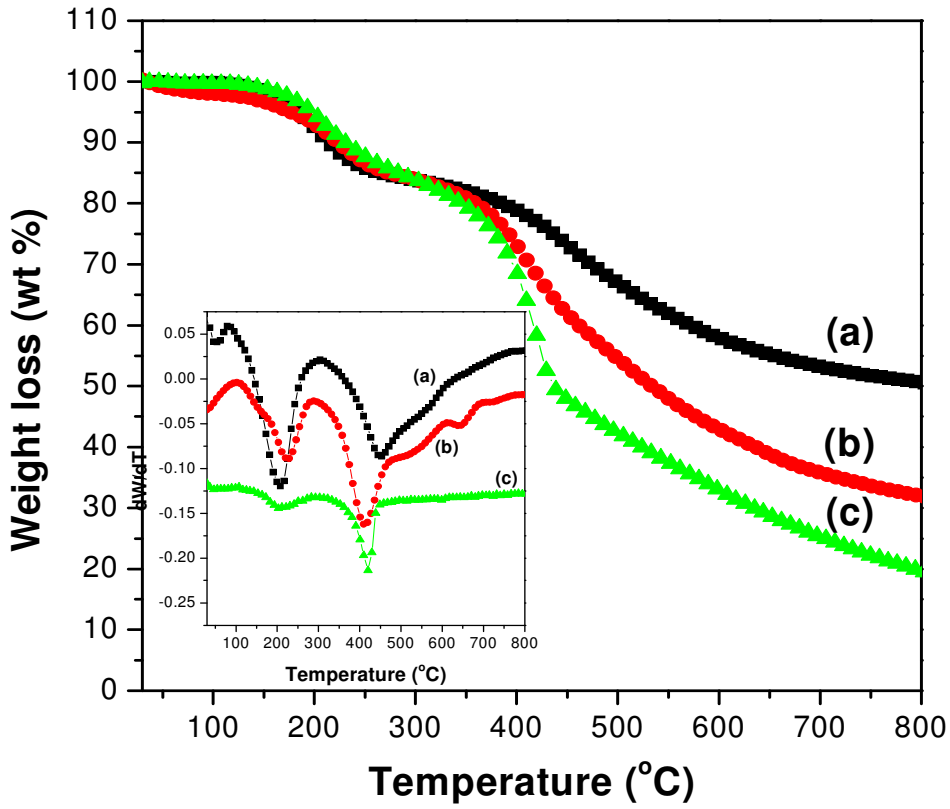

Figure S6. TGA and DTG curves of (a) phenolic formaldehyde (PF), (b) as-made LP-FDU-18 without addition of *h*-PS_{49}, and (c) as-made LP-FDU-18-20 with 20 wt% addition of *h*-PS_{49}. The pyrolysis processes were conducted in N_2 with a heating rate of 5 °C /min.

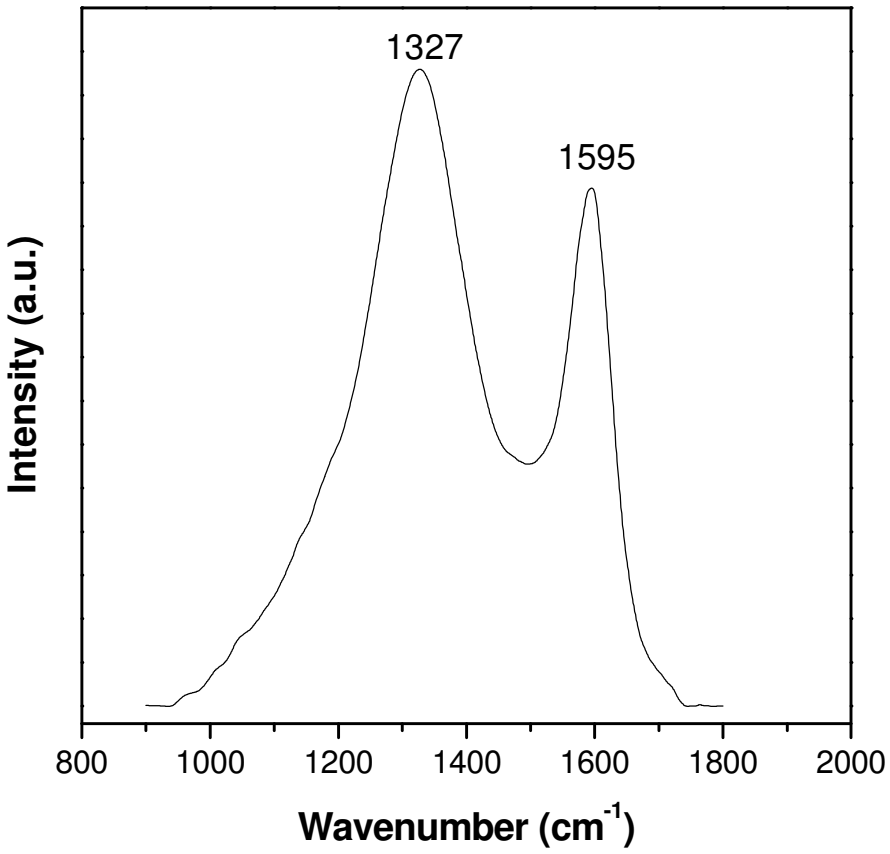

Figure S7. Raman spectra of LP-FDU-18-20-800 prepared by adding 20 wt% *h*-PS_{49} after carbonization at 800 °C under N_2, showing G band at 1595 cm^{-1} and D band at 1327 cm^{-1}. It suggests that the obtained ordered mesoporous carbons have a low degree of graphitization.

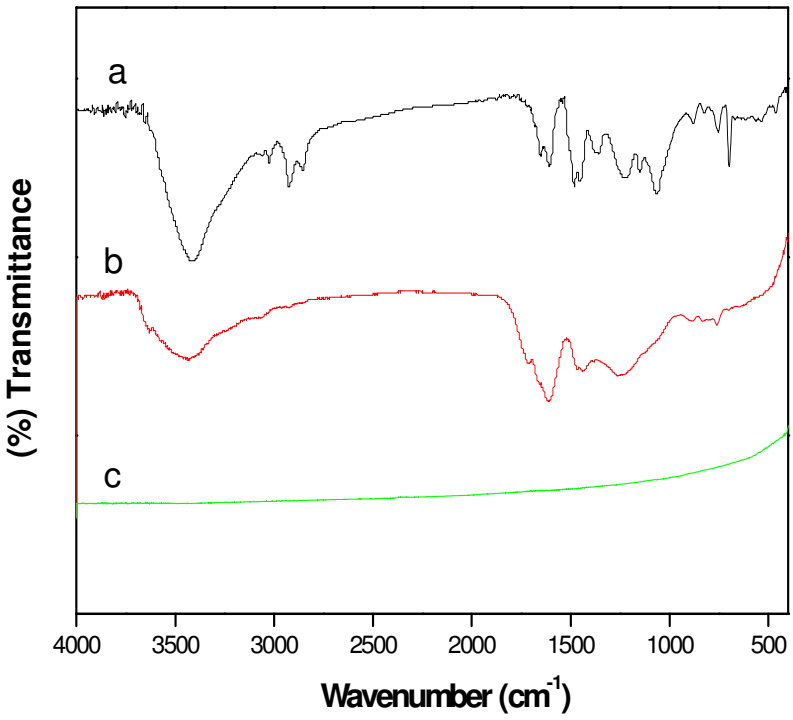

Figure S8. FT-IR spectra of as-made LP-FDU-18-20 (a), LP-FDU-18-20-450 (b) and LP-FDU-18-20-800 (c). In the curve (a), the strong and broad band at 3400 cm^{-1} is associated with the phenolic –OH groups, and the bands at 1100 and 2800 cm^{-1} are assigned to PEO-*b*-PS and *h*-PS. The disappearance of characteristic bands at 1109 cm^{-1} associated with PEO block and at 2850-2930 cm^{-1} assigned to PS block in curve (b) suggests the decomposition of PEO-*b*-PS template and *h*-PS by pyrolysis in N_2. For curve (c), no absorption was observed, suggesting a carbon framework by pyrolysis at higher temperature.