

Supporting Information

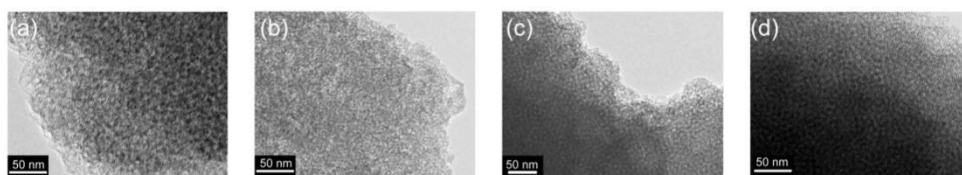


Figure S1. Magnified TEM images of HPC prepared at CO₂ pressure of (a) 2.90, (b) 3.90, (c) 4.90, and (d) 5.90 MPa.

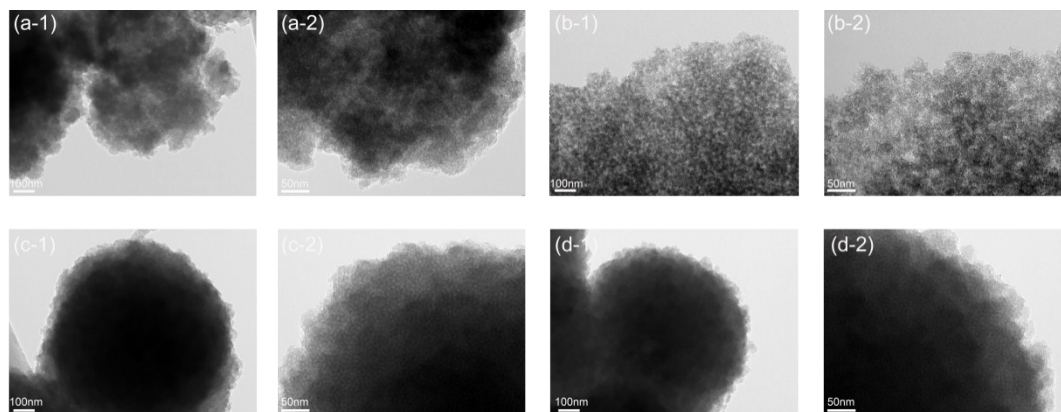


Figure S2. TEM images of PSC prepared at CO₂ pressure of (a) 2.90, (b) 3.90, (c) 4.90, and (d) 5.90 MPa.

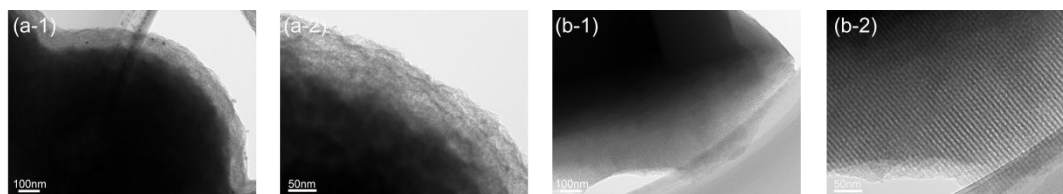


Figure S3. TEM images of PSC prepared at 4.90 MPa with the molar ratio of F127 and BTEB (a) 1:12.71 and (b) 1:39.12.

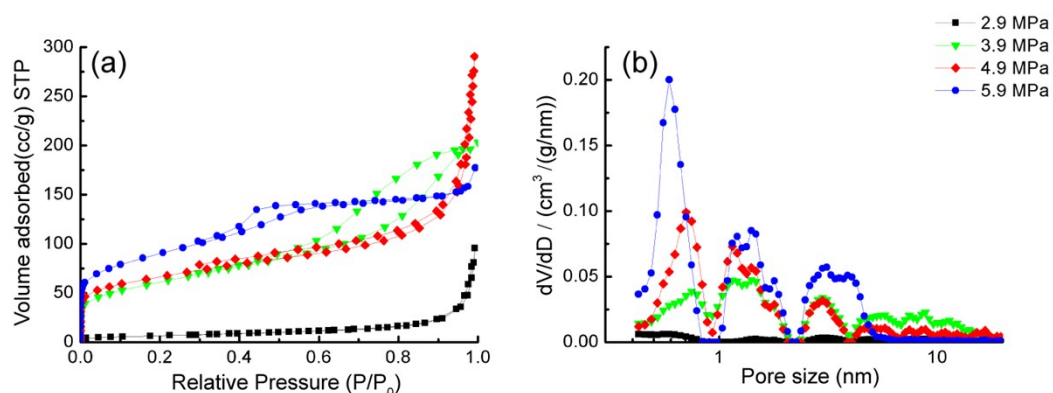
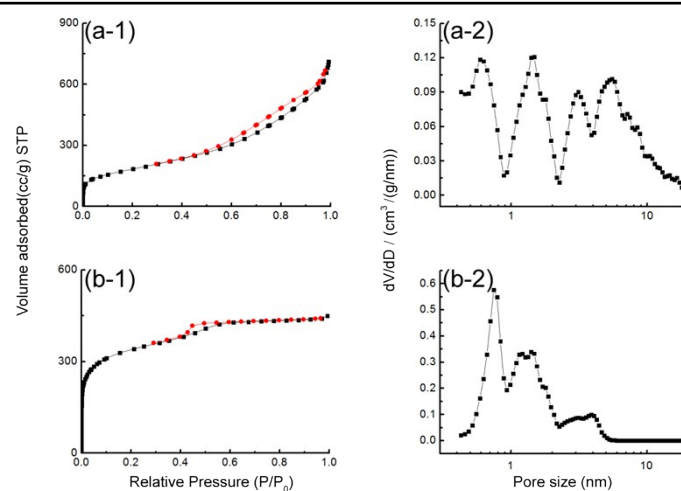
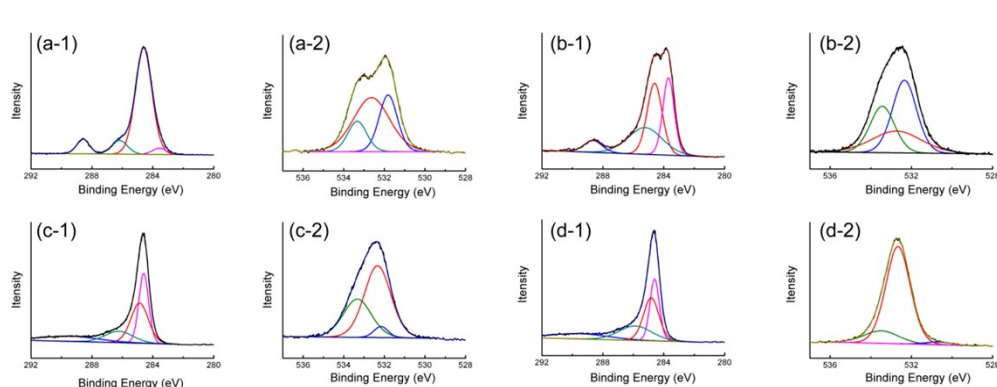


Figure S4. (a) Nitrogen adsorption–desorption isotherms, and (b) pore size distributions of PSC prepared at different CO₂ pressure.

Table S1. Nitrogen physisorption data of PSC prepared at different CO₂ pressures.

Pressure (MPa)	S_{BET} ($\text{m}^2 \text{g}^{-1}$)	V_{total} ($\text{cm}^3 \text{g}^{-1}$)	Micropore size (nm)	Mesopore size (nm)
PSC-2.9	189	0.29	0.59+1.47	3.11
PSC-3.9	222	0.43	0.75+1.40	2.97
PSC-4.9	232	0.44	0.70+1.15	2.84
PSC-5.9	219	0.31	0.59+1.40	2.97
PSC-sph	138	0.11	0.59+1.40	2.84
PSC-str	238	0.34	0.75+1.15	3.11

**Figure S5.** Nitrogen adsorption–desorption isotherms and pore size distributions of (a) PSC-sph, and (b) PSC-str.**Figure S6.** Deconvoluted C1s and O1s XPS spectra of (a) PSC-2.9, (b) PSC-3.9, (c) PSC-4.9, and (d) PSC-5.9.**Table S2.** Surface C and O configurations of PSC by XPS.

Sample	C configuration ^a (%)				O configuration ^b (%)		
	C-I	C-II	C-III	C-IV	O-I	O-II	O-III
PSC-2.9	3.87	78.30	9.55	8.28	28.07	54.93	17.0
PSC-3.9	28.68	34.83	29.63	6.86	44.20	27.10	28.70
PSC-4.9	34.18	35.12	15.90	14.80	4.99	60.79	34.22
PSC-5.9	28.72	32.88	23.95	14.45	2.45	82.51	15.04

^a: C sp² and sp³ (C-I), C–O (C-II), C=O (C-III) and O–C=O (C-IV).

^b: C=O (O-I), C–OH and/or C–O–C (O-II), –COOH (O-III).

The surface chemical properties of all HPC samples have been measured with energy dispersive X-ray spectrometry (EDS) elemental mapping (Tables S3). The results show that there is almost no difference in the chemical compositions among them.

Table S3. Chemical composition of HPC prepared at different CO₂ pressures from EDS element mapping.

Sample	C (%)	O (%)
PSC-2.9	61.31	38.69
PSC-3.9	59.24	40.76
PSC-4.9	62.33	37.67
PSC-5.9	59.89	40.11