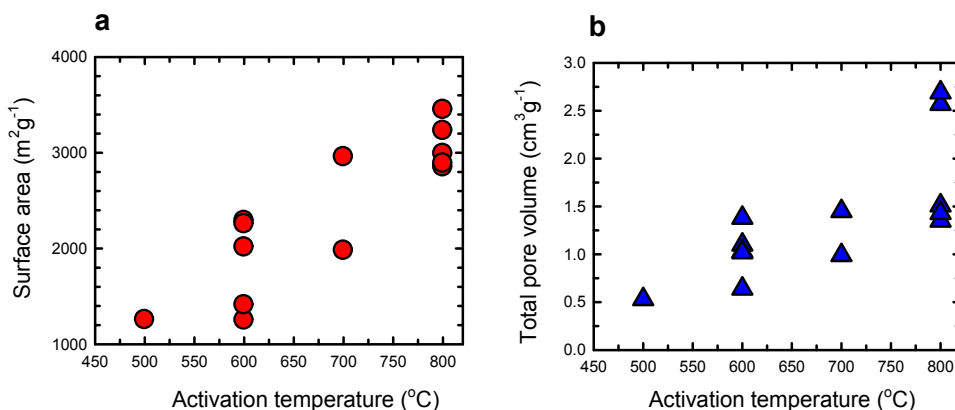


## Defining a performance map of porous carbon sorbents for high-pressure carbon dioxide uptake and carbon dioxide-methane selectivity

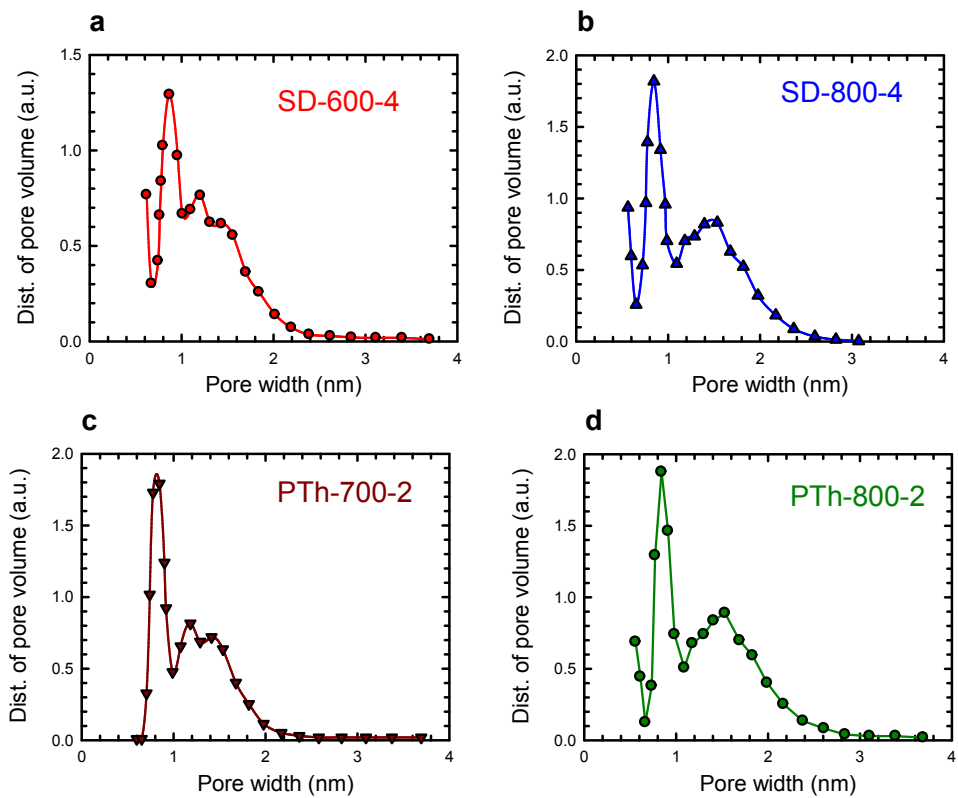
Saunab Ghosh,<sup>a</sup> Marta Sevilla,<sup>b</sup> Antonio B. Fuertes,<sup>\*b</sup> Enrico Andreoli,<sup>\*c</sup> Jason Ho,<sup>d</sup> and Andrew R. Barron<sup>\*a,c,e</sup>

**Table S1.** Summary of elemental analysis, physical properties and CO<sub>2</sub> uptake for NPC and SPC precursors.

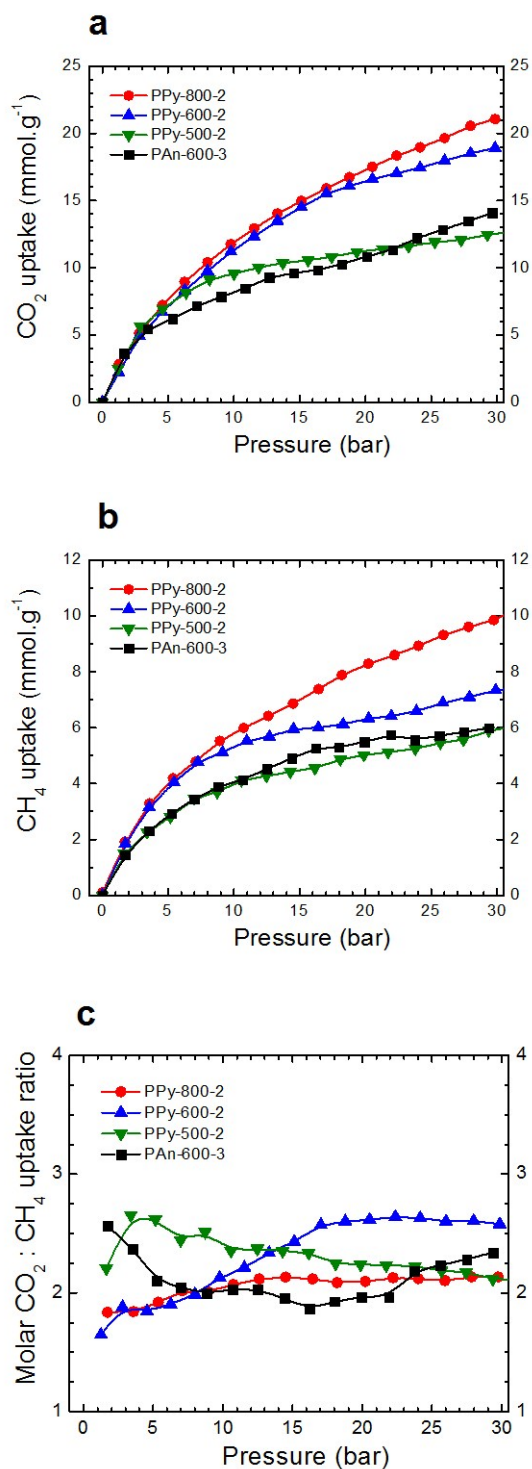
Sample <sup>a</sup>	C (wt%) <sup>b</sup>	O (wt%) <sub>b</sub>	N (wt%) <sub>b</sub>	S (wt%) <sub>b</sub>	Surface area S <sub>BET</sub> (m <sup>2</sup> g <sup>-1</sup> )	Total pore volume (cm <sup>3</sup> g <sup>-1</sup> )	CO <sub>2</sub> uptake at 30 bar (mmol.g <sup>-1</sup> )
Polypyrrole	65.75	18.26	15.98	0.00	62.00	0.03	3.09
PTh	63.35	11.84	0.00	24.81	75.00	0.04	2.85



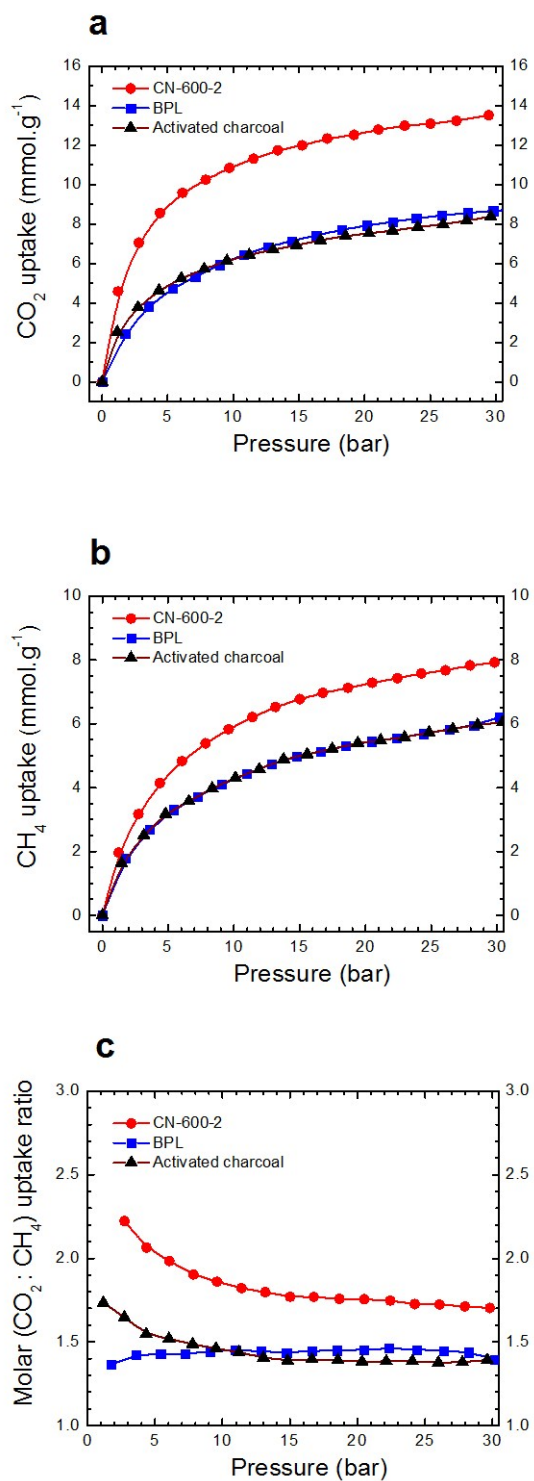
**Fig. S1** Estimated (a) surface area and (b) total pore volume as a function of activation temperature for PC, NPC and SPC samples.



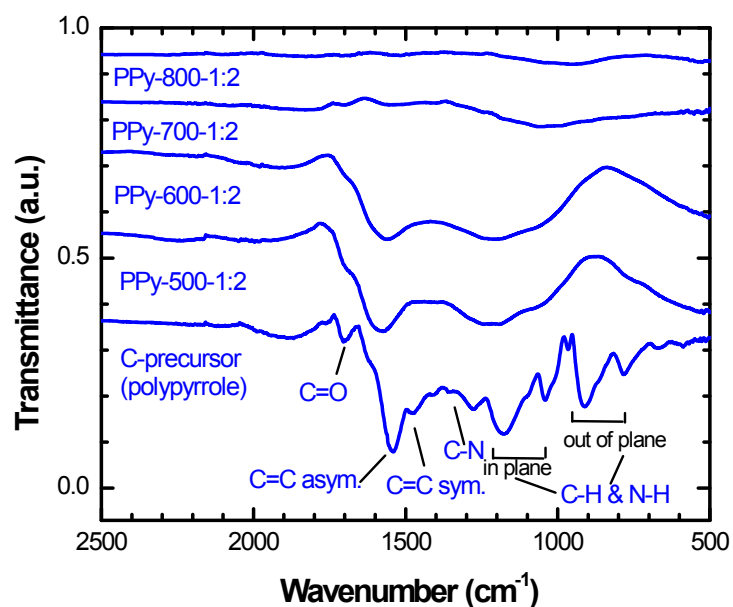
**Fig. S2** Distribution of pore volumes as a function of pore width for (a) SD-600-4 (b) SD-800-4 (c) PTh-700-2 and (d) PTh-800-2 samples.



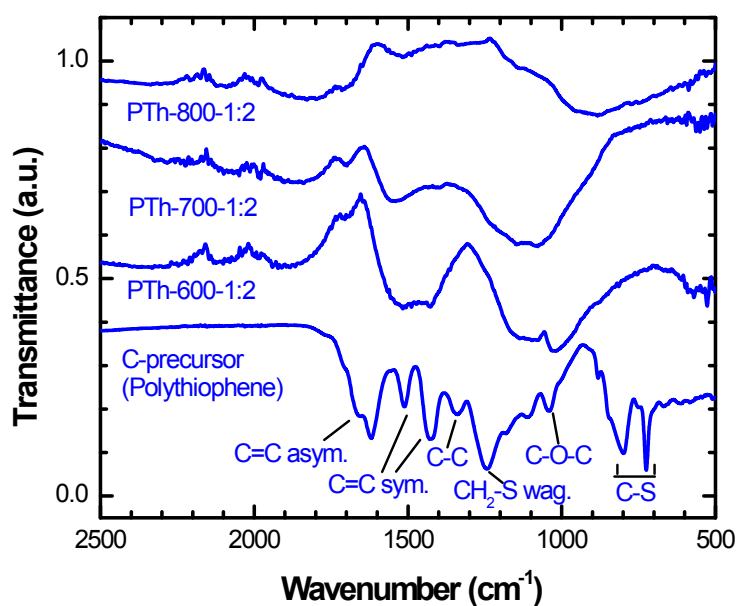
**Fig. S3** Room temperature volumetric (a) CO<sub>2</sub> and (b) CH<sub>4</sub> adsorption uptake measurements for other NPC samples. (c) The molar CO<sub>2</sub>:CH<sub>4</sub> uptake ratio as a function of gas pressure for PC, NPC, and SPC samples. Experiments were performed at 24 °C.



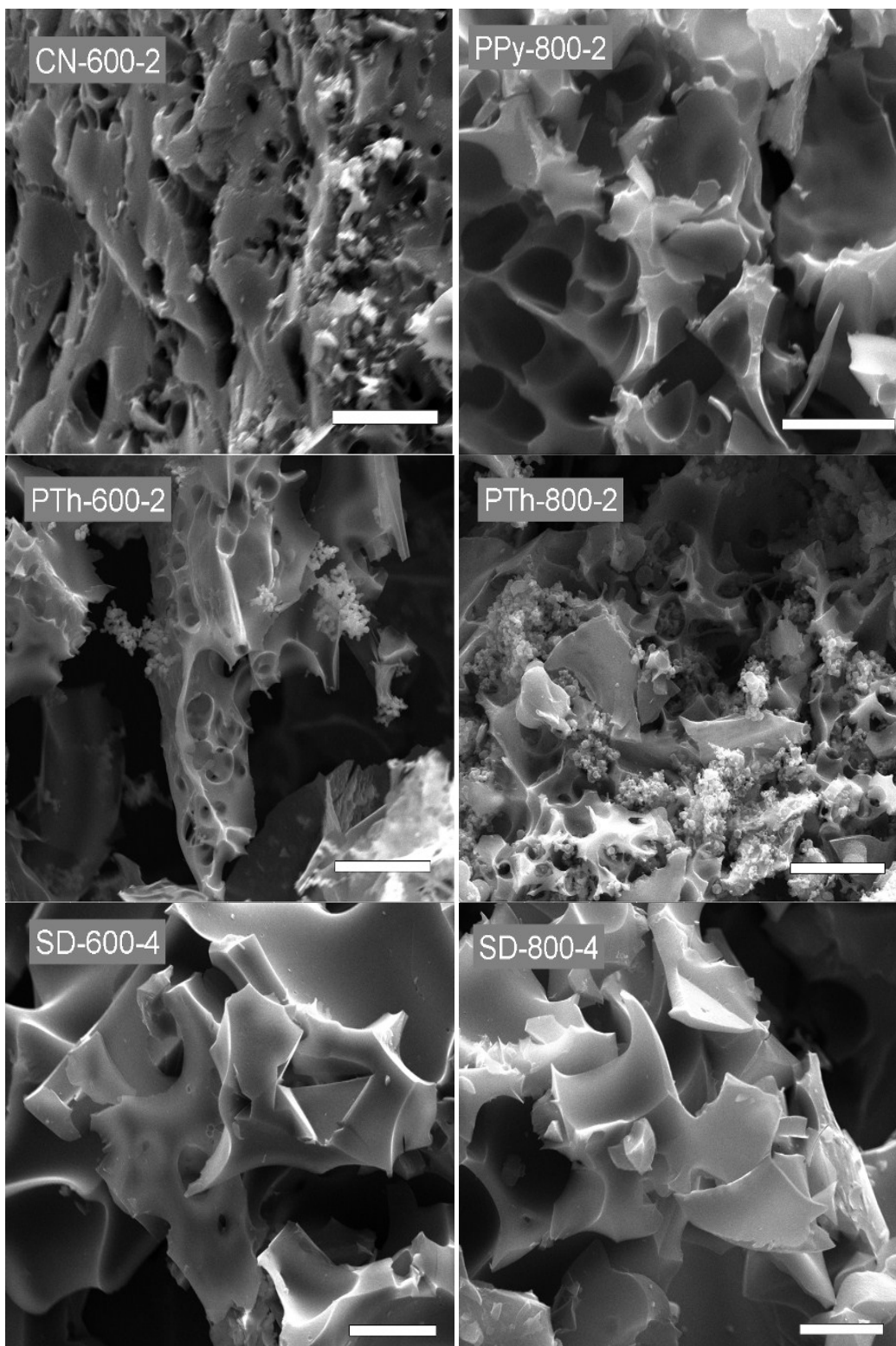
**Fig. S4** Room temperature volumetric (a) CO<sub>2</sub> and (b) CH<sub>4</sub> adsorption uptake measurements for other PC samples. (c) The molar CO<sub>2</sub>:CH<sub>4</sub> uptake ratio as a function of gas pressure for PC, NPC, and SPC samples. Experiments were performed at 24 °C.



**Fig. S5.** Characterization of chemical composition of N-containing polymer precursor and porous carbon samples activated at increasing temperatures by FTIR spectroscopy.



**Fig. S6** Characterization of chemical composition of S-containing polymer precursor and porous carbon samples activated at increasing temperatures by FTIR spectroscopy.



**Fig S4.** Scanning electron microscope (SEM) images of different activated PC samples synthesized from coconut shell, polypyrrole, polythiophene and sawdust respectively.