

Highly Microporous Polymer-Based Carbons for CO₂ and H₂ Adsorption

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Table S1. Structural parameters for the carbons studied.^a

Carbon	V _t (cm ³ g ⁻¹)	V ^{as} _{mi1} (cm ³ g ⁻¹)	V ^{as} _{mi2} (cm ³ g ⁻¹)	V ^{as} _{me} (cm ³ g ⁻¹)	S ^{as} _{ext} (m ² g ⁻¹)	w ^{KJS} _{mi2} (nm)	w ^{KJS} _{me} (nm)
C	0.12	0.01	0.08	0.04	0.7	0.88	1.77
C-1	0.44	0.07	0.30	0.14	8.7	0.78	2.19
C-2	0.83	0.19	0.64	0.19	18.5	0.76	1.92
C-3	1.70	0.27	1.28	0.42	35.6	0.79	2.03
C-4	2.07	0.31	1.59	0.48	33.4	0.78	2.07
C-5	1.95	0.22	1.47	0.48	28.5	0.78	2.20
C-6	1.54	0.14	1.18	0.36	12.3	0.79	2.25

^a C – carbon, C-X – X denotes the KOH/carbon weight ratio; V_t – total (single-point) pore volume obtained from the amount adsorbed at p/p₀ ≈ 0.99; V^{as}_{mi1} – volume of small micropores (roughly corresponds to the volume of ultramicropores; pores < 0.75 nm) obtained on the basis of α_s method in the range of 0.25 – 0.5; V^{as}_{mi2} – volume of all micropores (pores < 2 nm) and very small mesopores obtained on the basis of basis of α_s method in the range of 0.9 – 1.3; V^{as}_{me} – volume of mesopores obtained by subtracting V^{as}_{mi2} from V_t; S^{as}_{ext} – external surface area obtained on the basis of basis of α_s method in the range of 3 – 8; w^{KJS}_{mi2} – micropore width obtained by the KJS method; w^{KJS}_{me} – mesopore width obtained by the KJS method.

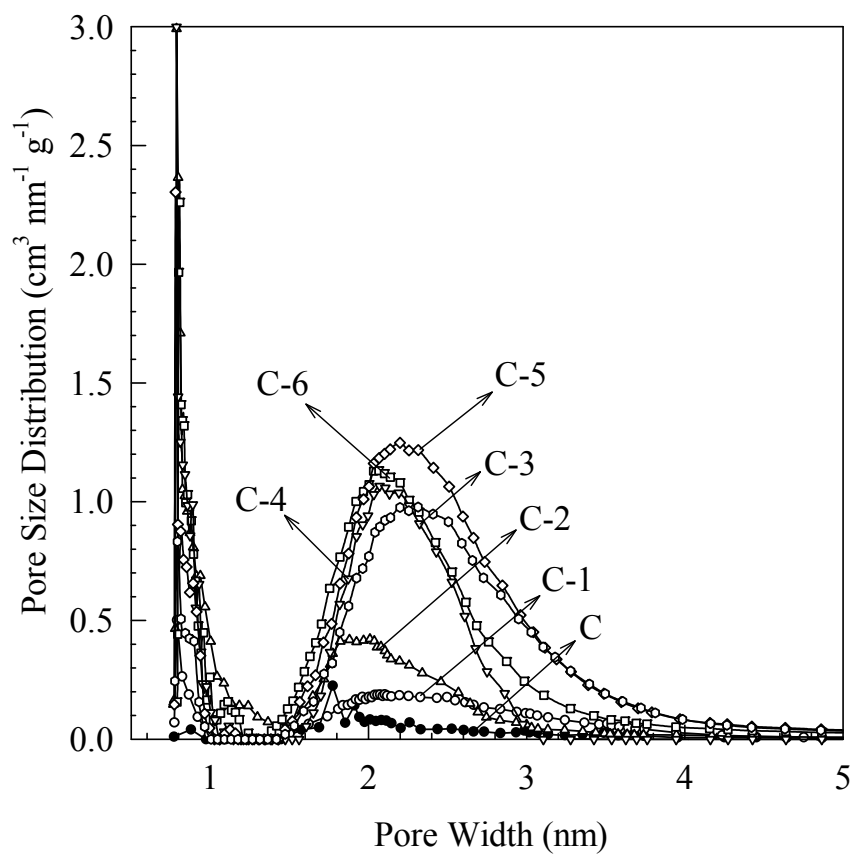


Figure S1. Pore size distribution functions, calculated by the KJS method, for the carbon material C, and the activated carbons: C-1, C-2, C-3, C-4, C-5, and C-6.

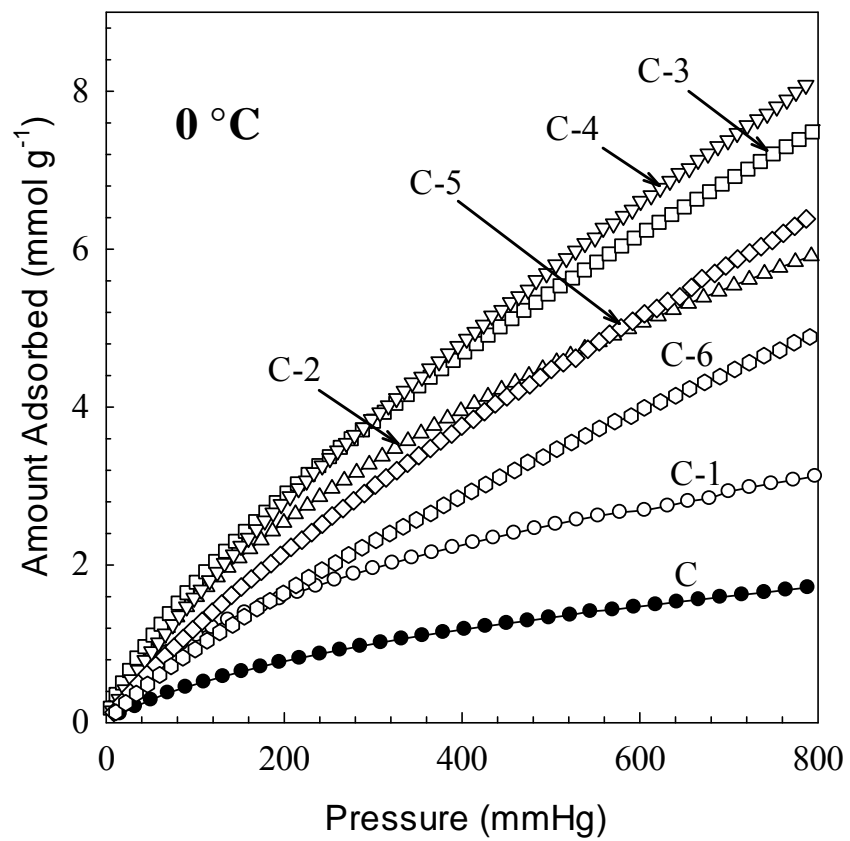


Figure S2. CO₂ adsorption isotherms measured at 0 °C for all carbon materials.

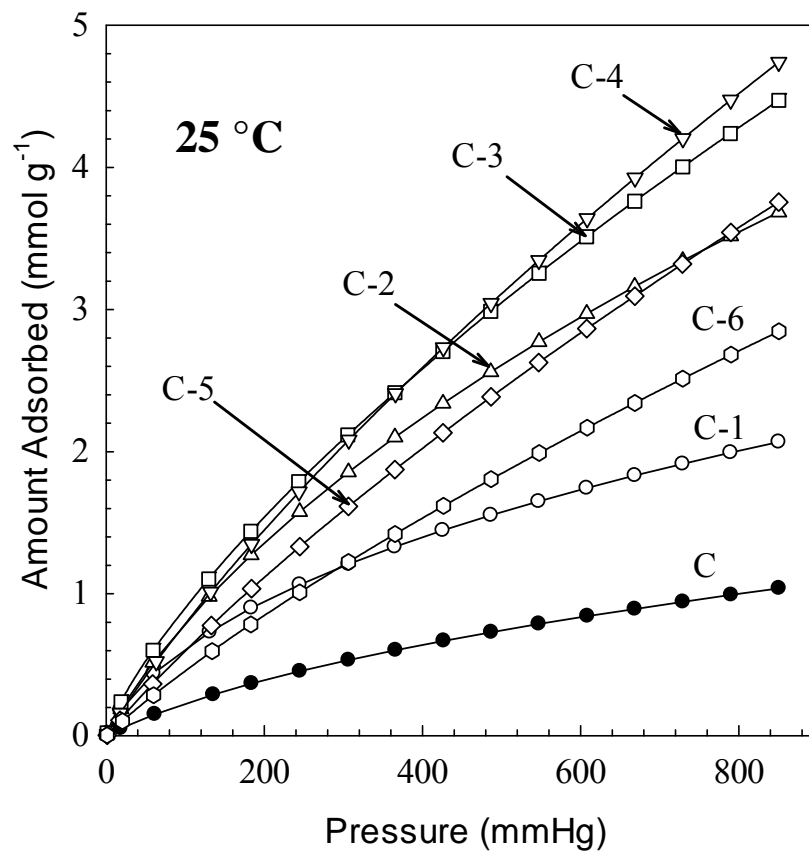


Figure S3. CO₂ adsorption isotherms measured at 25 °C for all carbon materials.

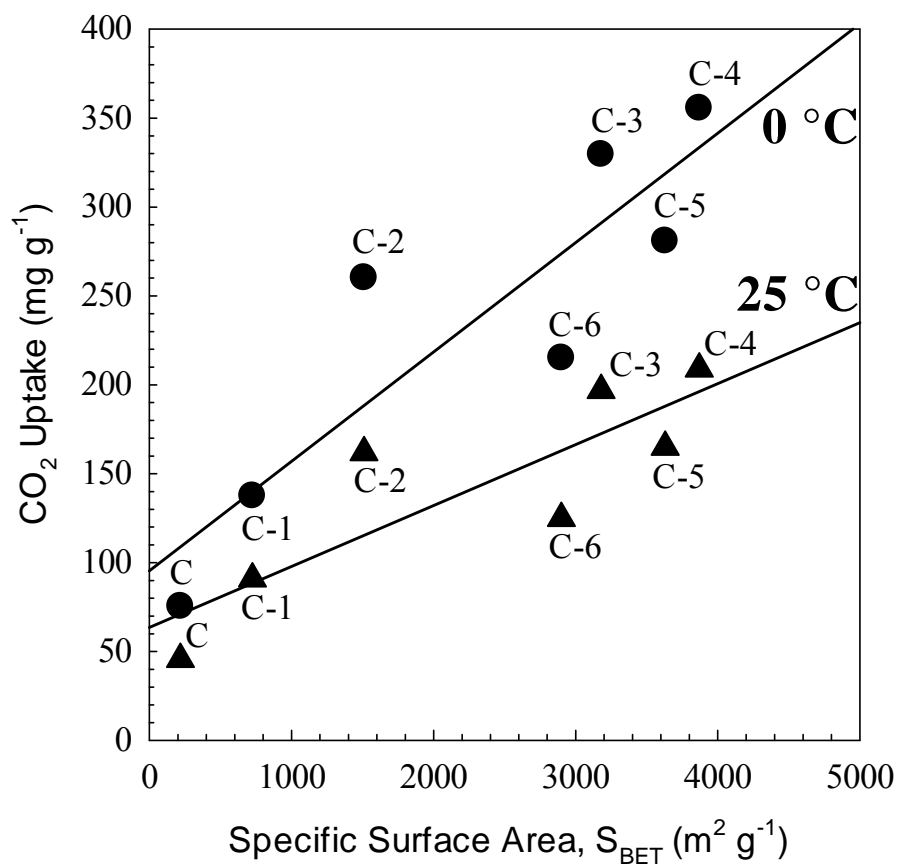


Figure S4. CO_2 uptake at 0 °C, 800 mmHg and 25 °C, 850 mmHg as a function of the specific surface area S^{BET} for all carbon materials.

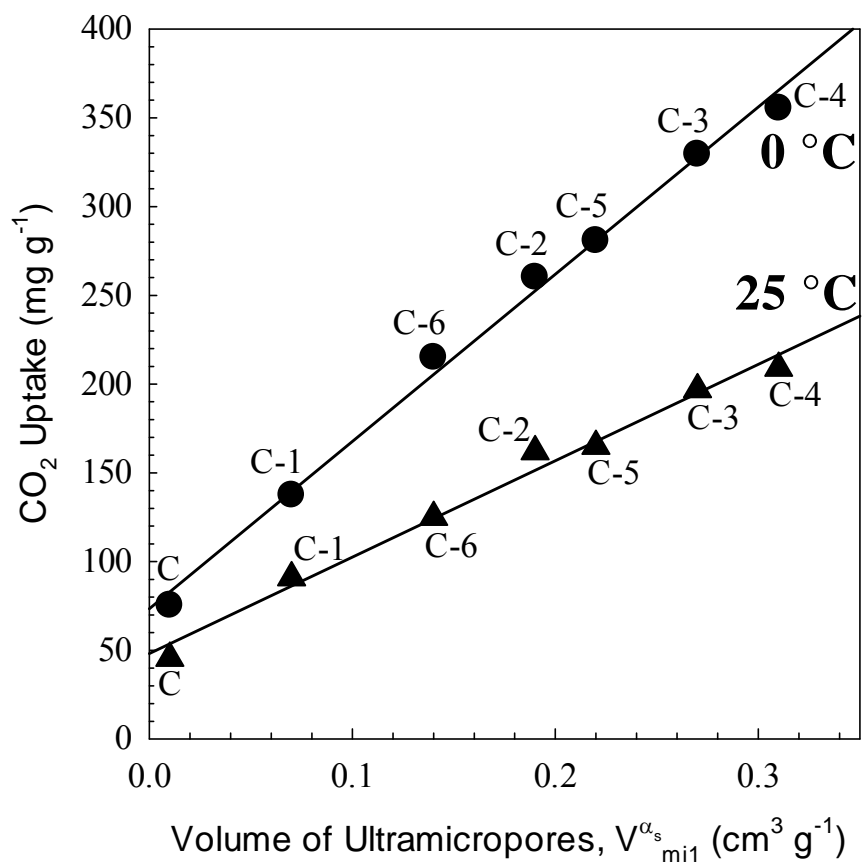


Figure S5. CO₂ uptake at 0 °C, 800 mmHg and 25 °C, 850 mmHg as a function of the ultramicropore volume $V_{mi1}^{\alpha s}$ for all carbon materials.

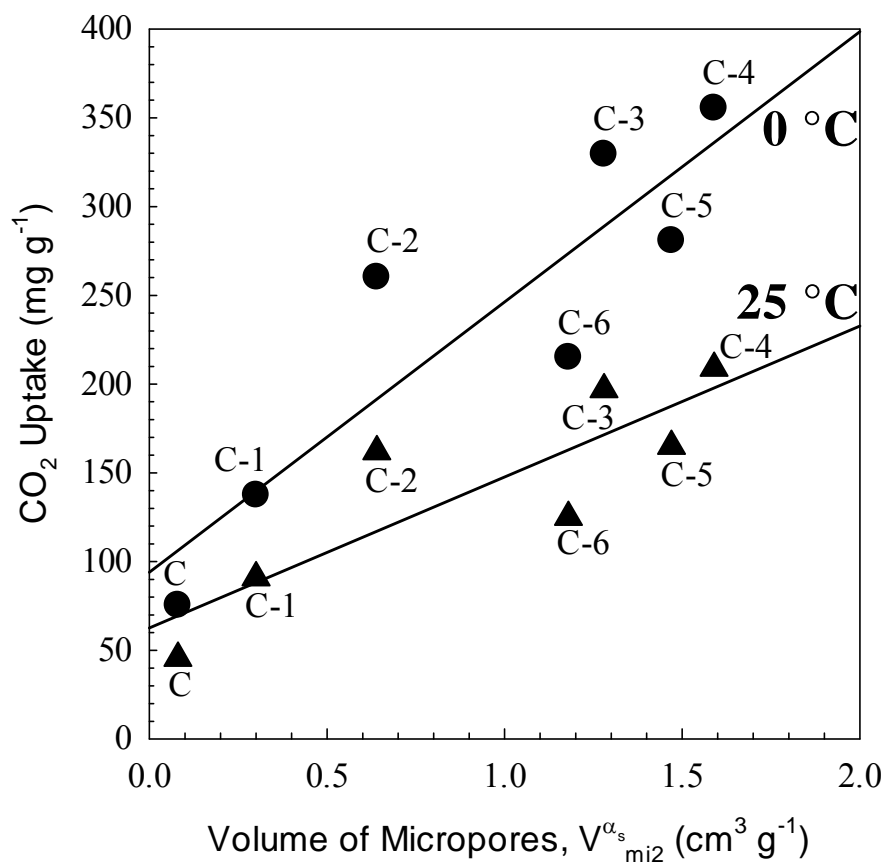


Figure S6. CO₂ uptake at 0 °C, 800 mmHg and 25 °C, 850 mmHg as a function of the micropore volume $V_{mi2}^{\alpha_s}$ (obtained by α_s method in the range of $\alpha_s = 0.9 \div 1.3$) for all carbon materials.

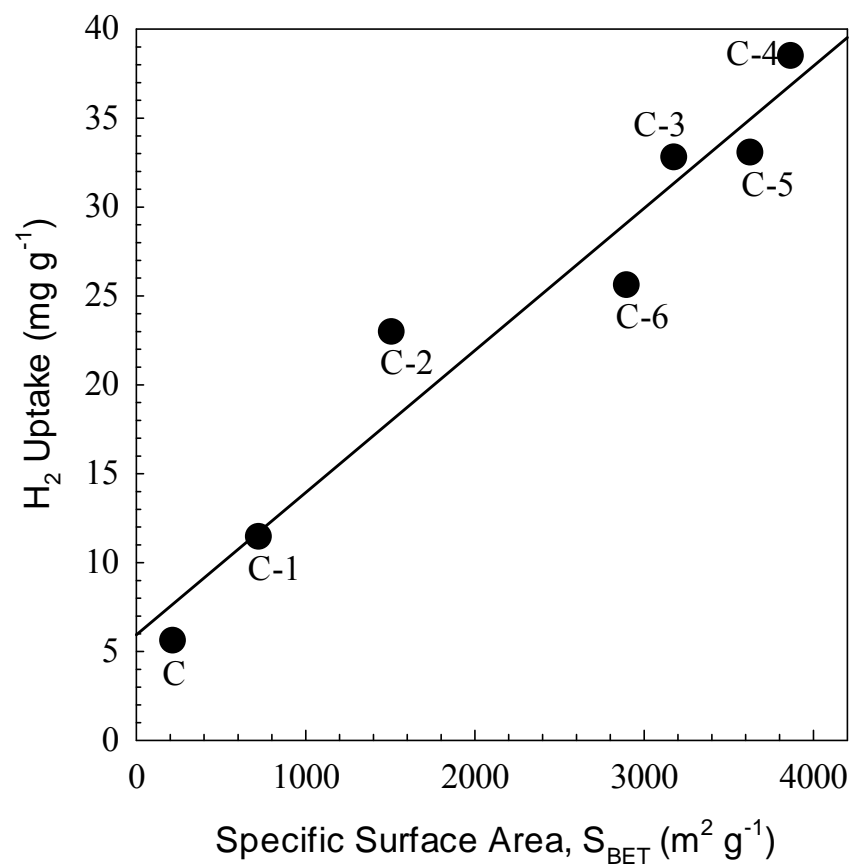


Figure S7. H₂ uptake at -196 °C and 850 mmHg as a function of the specific surface area S^{BET} for all carbon materials.

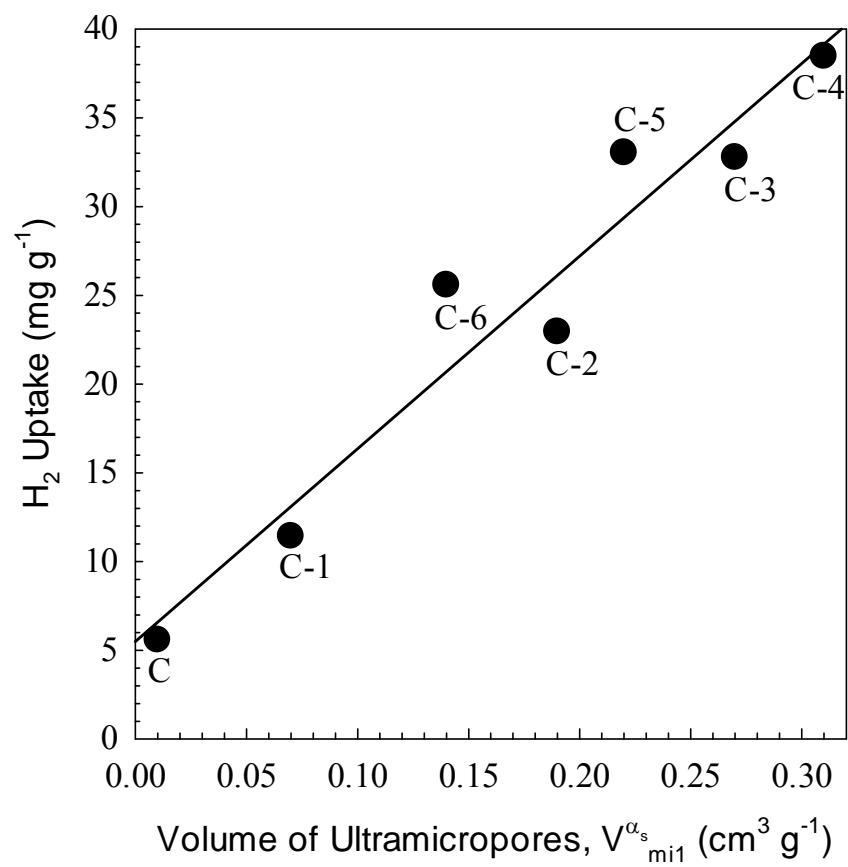


Figure S8. H₂ uptake at -196 °C and 850 mmHg as a function of the volume of ultramicropores

V_{mi1}^{α_s} (obtained by α_s method in the range of α_s = 0.25 ÷ 0.50) for all carbon materials.

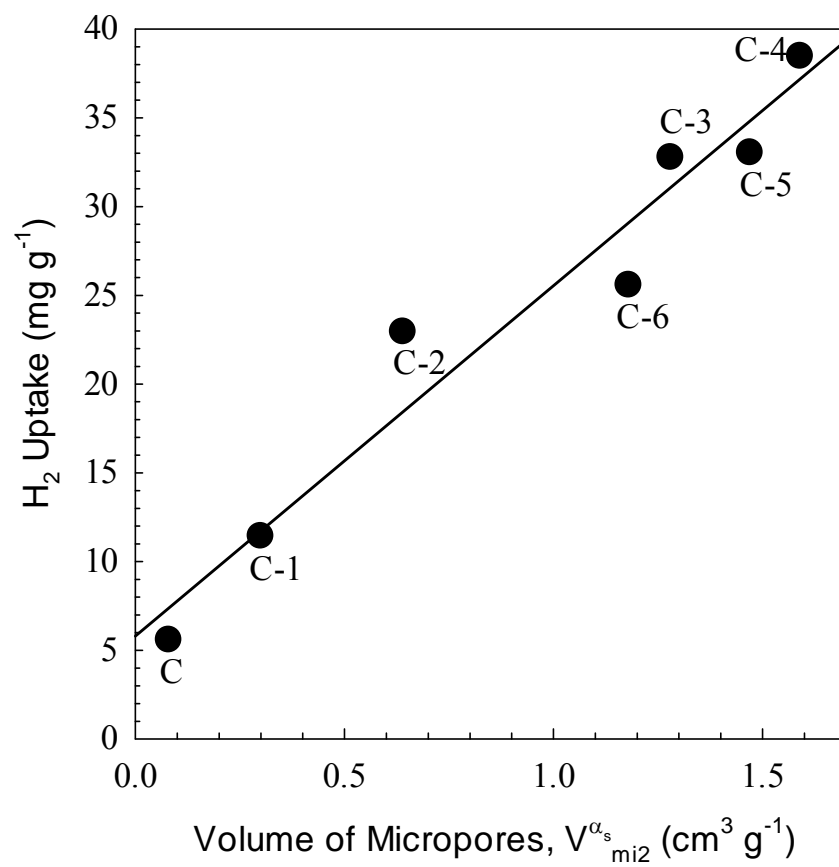


Figure S9. H₂ uptake at -196 °C and 850 mmHg as a function of the volume of micropores

V_{mi2}^{α_s} (obtained by α_s method in the range of α_s = 0.9 ÷ 1.3) for all carbon materials.