SUPPLEMENTARY INFORMATION

Biomass-derived activated carbon with simultaneously enhanced CO_2 uptake for both pre and post combustion capture applications

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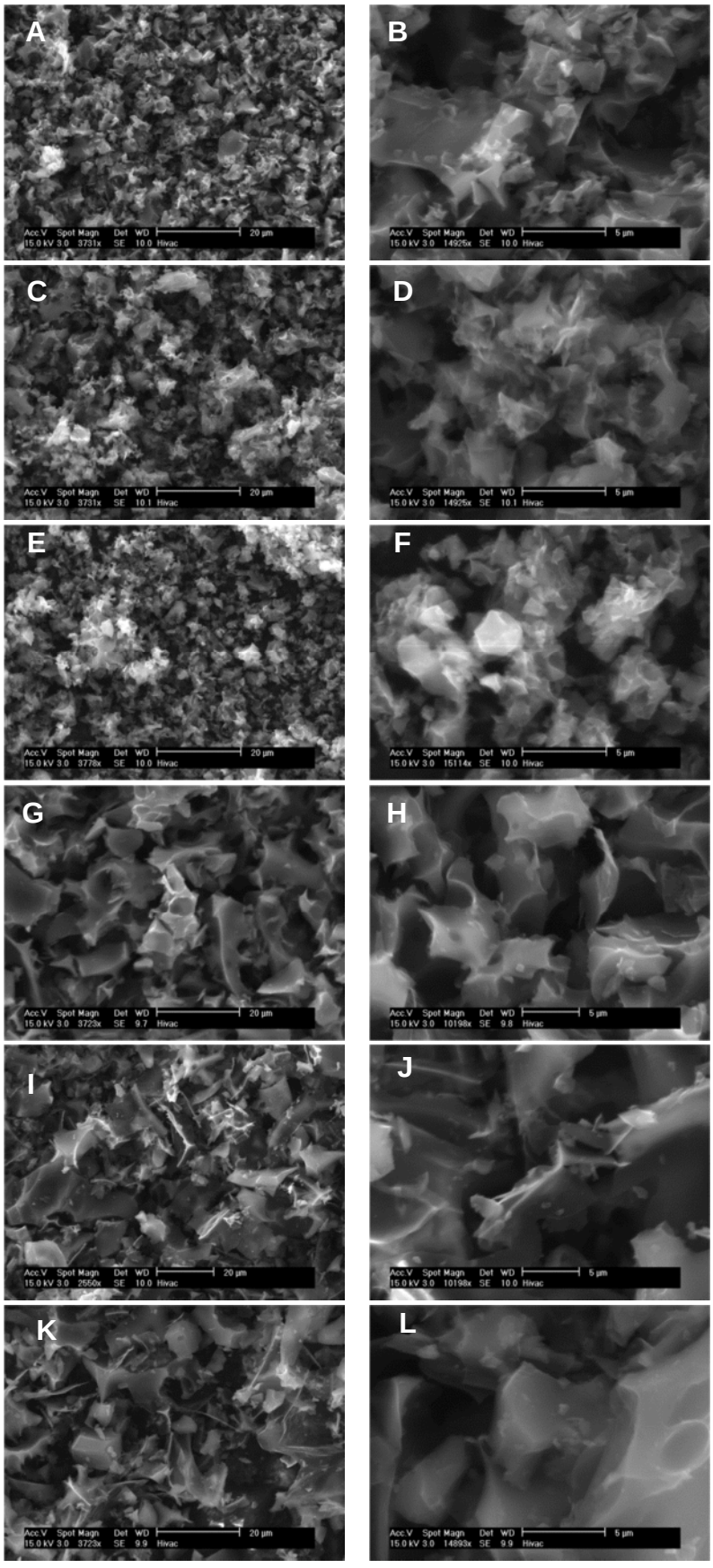


Figure S1. SEM images of activated carbons from Jujun grass; samples ACGR2600 (A, B), ACGR2700 (C, D), ACGR2800 (E, F), ACGR4600 (G, H), ACGR4700 (I, J) and ACGR4800 (K, L).

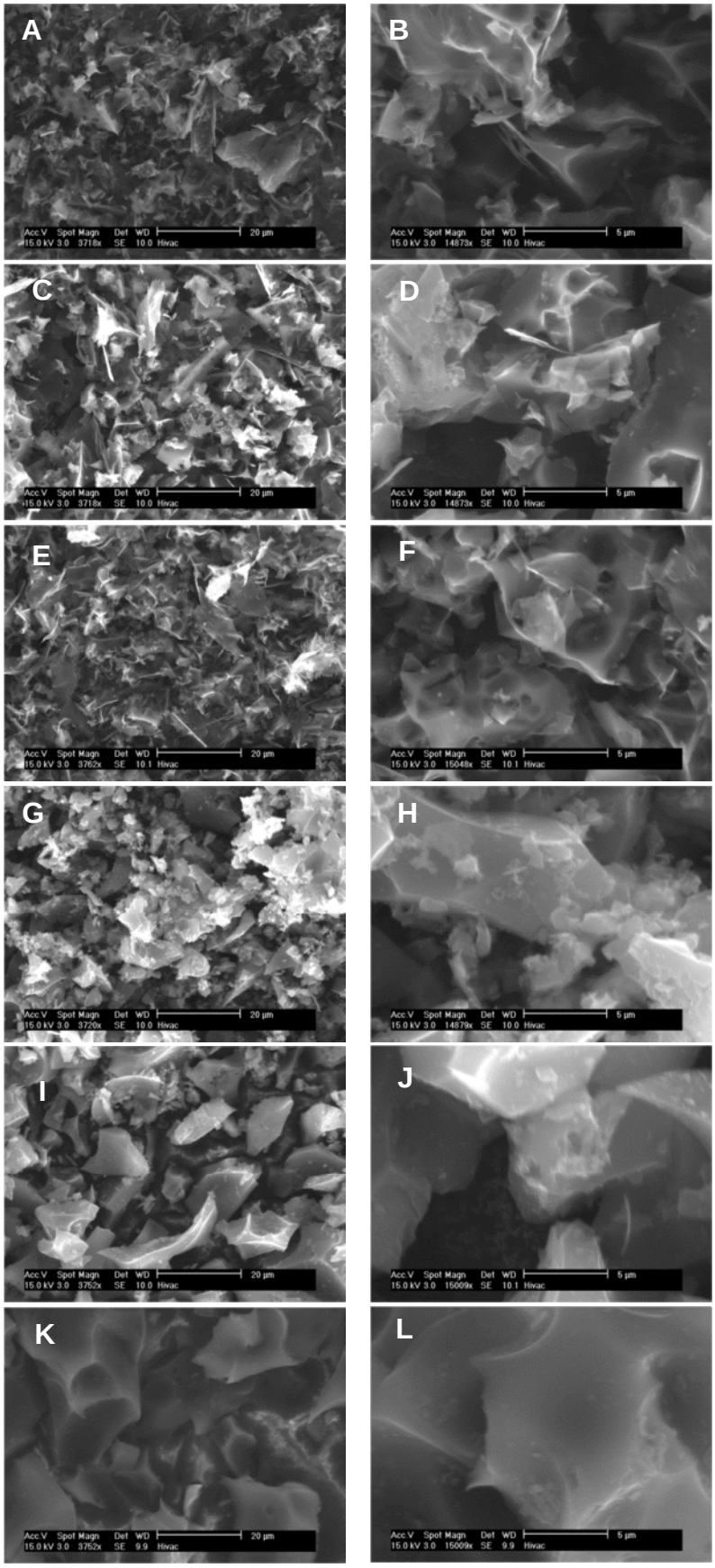


Figure S2. SEM images of activated carbons from *Camellia japonica*; samples ACCA2600 (A, B), ACCA2700 (C, D), ACCA2800 (E, F), ACCA4600 (G, H), ACCA4700 (I, J) and ACCA4800 (K, L).

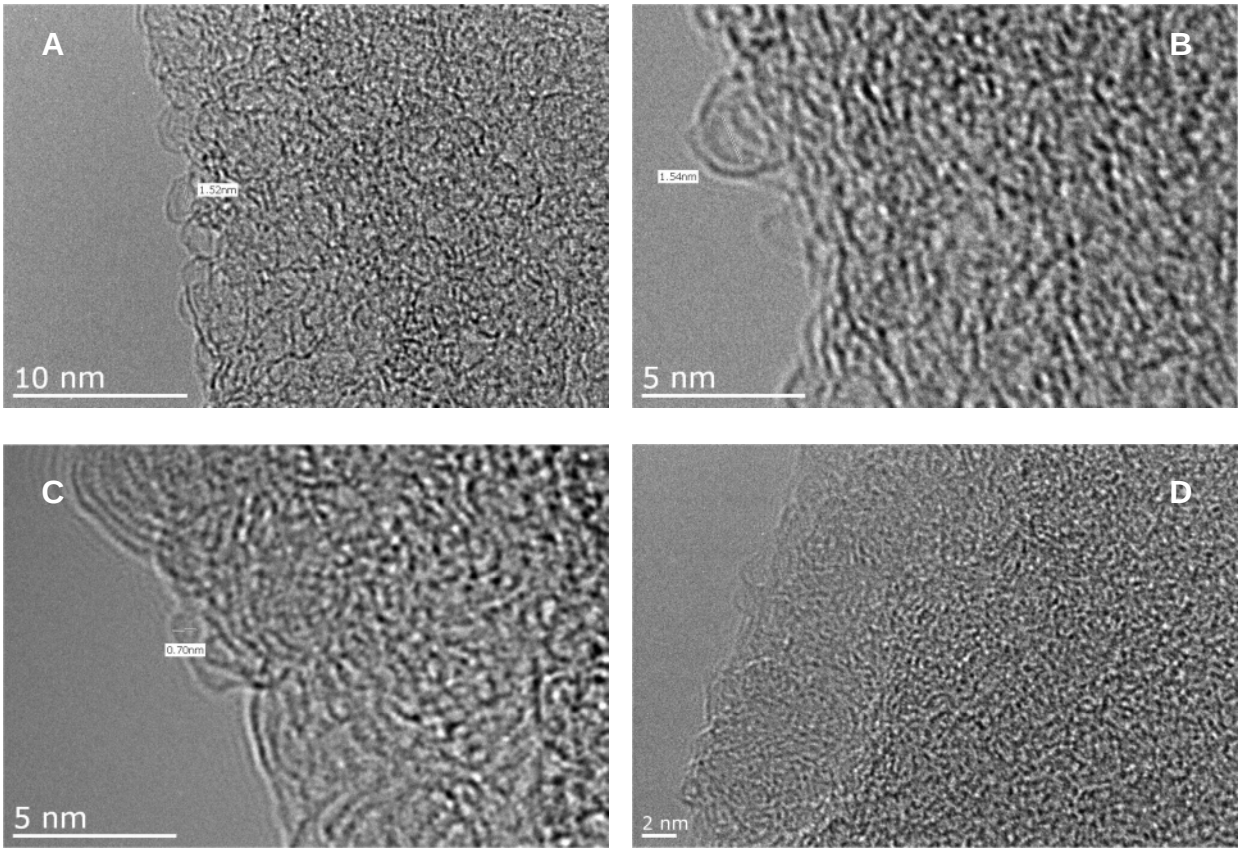


Figure S3. TEM images of sample ACGR4700 (A and B) and sample ACCA2700 (C and D).

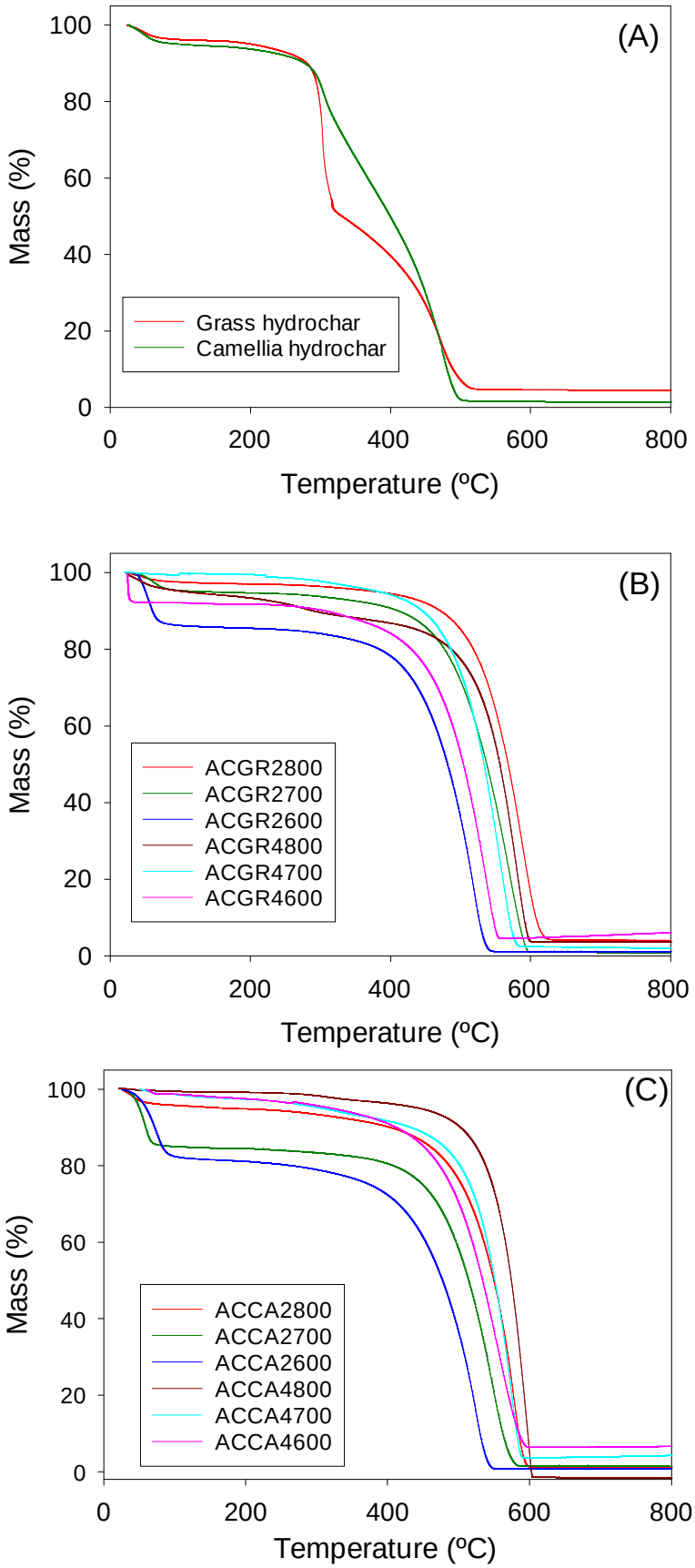


Figure S4. Thermogravimetric analysis (TGA) curves of hydrochar materials (A) and activated carbons from Jujun grass (B) and *Camellia japonica* (C).

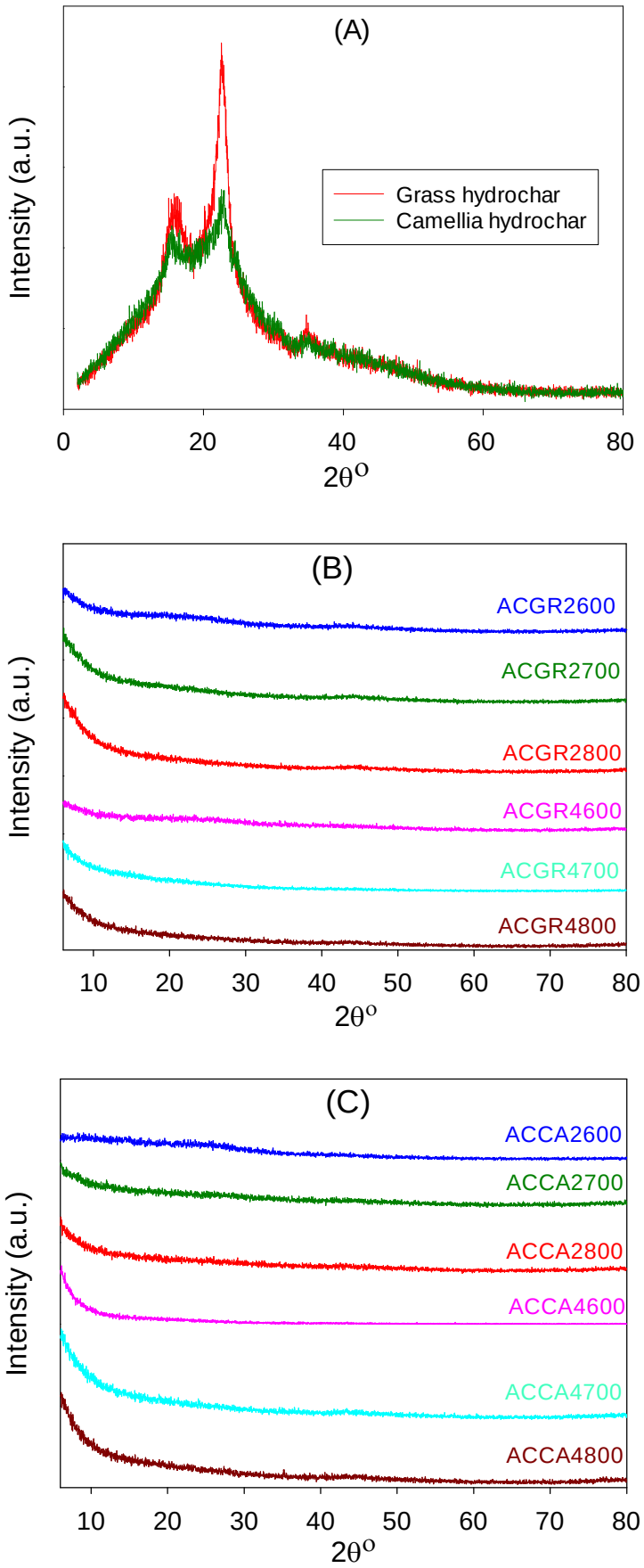
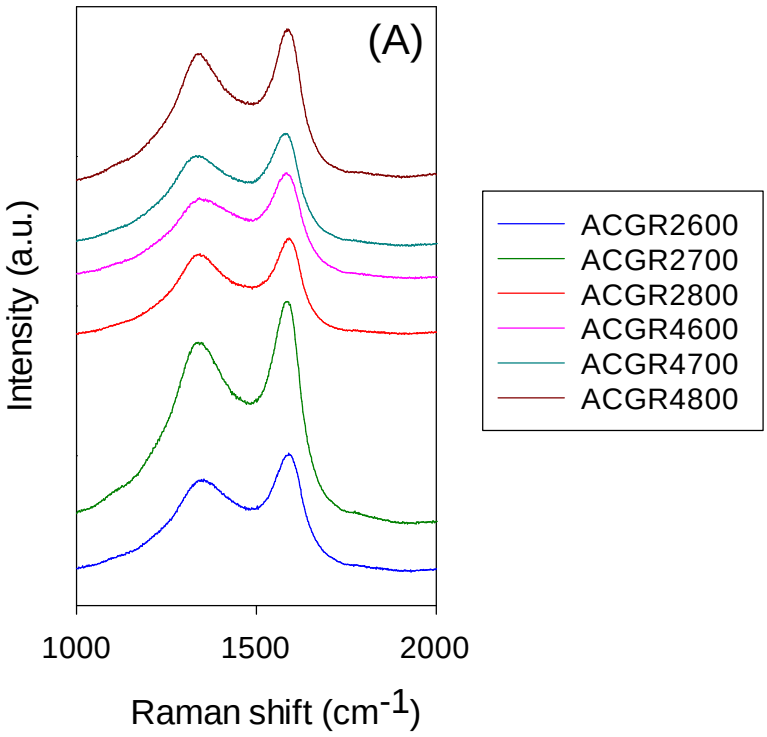


Figure S5. Powder XRD patterns of hydrochar materials (A) and activated carbons prepared from Jujun grass (B) and *Camellia japonica* (C).



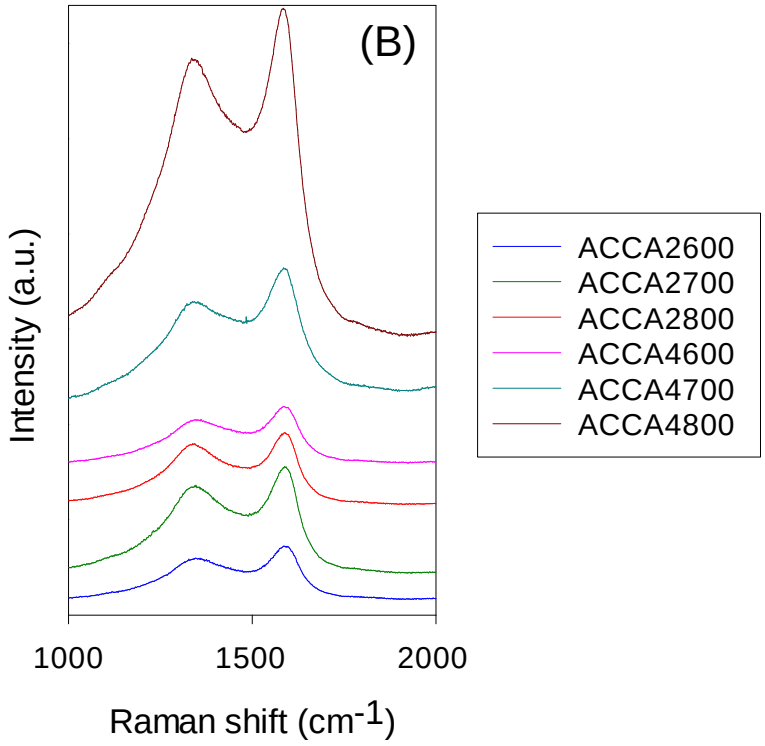


Figure S6. Raman spectra of activated carbons from Jujun grass (A) and *Camellia japonica* (B).

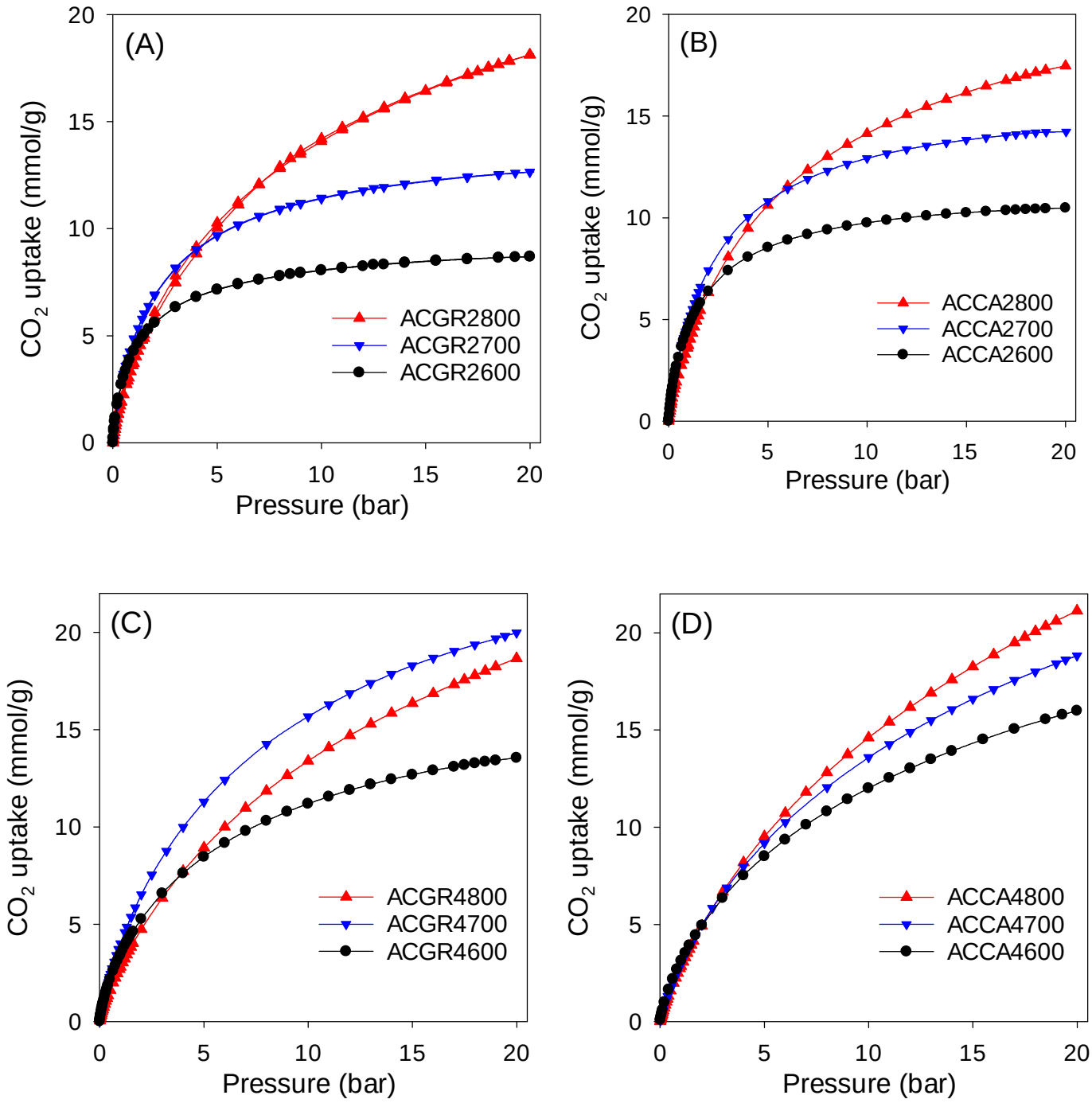


Figure S7. CO_2 uptake isotherms at 25 ^{o}C and in the pressure range 0 – 20 bar for carbons derived from Jujun grass (A, C) and *Camellia japonica* (B, D) activated at KOH/hydrochar ratio of 2 (A, B) and 4 (C, D).

Supporting Table S1. CO_2 uptake of various porous carbons at 25 °C and 0.15 bar or 1 bar.

	CO_2 uptake (mmol/g)		Reference
	1 bar	0.15 bar	
Sawdust-derived activated carbon	4.8	1.2	1
KOH-activated templated carbons	3.4	~1.0	2
Hierarchical porous carbon (HPC)	3.0	~0.9	3
Petroleum pitch-derived activated carbon	4.55	~1.0	4
Activated carbon spheres	4.55	~1.1	5
Phenolic resin activated carbon spheres	4.5	~1.2	6
Lignin derived activated carbon	4.6	1.0	7
Fungi-derived activated carbon	3.5	~1.0	8
Chitosan-derived activated carbon	3.86	~1.1	9
Polypyrrole derived activated carbon	3.9	~1.0	10
Soya bean derived N-doped activated carbon	4.24	1.2	11
N-doped ZTCs	4.4	~1.0	12
Activated templated N-doped carbon	4.5	1.4	13
Polyaniline derived activated carbon	4.3	1.38	14
N-doped activated carbon monoliths	5.14	1.25	15
Activated N-doped carbon	3.2	1.5	16
Activated hierarchical N-doped carbon	4.8	1.4	17
Activated N-doped carbon from algae	4.5	~1.1	18

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