

Supporting Information

Synthesis, Characterization and CO₂ Uptake of Adsorbents Prepared by Hydrothermal Carbonization of Chitosan

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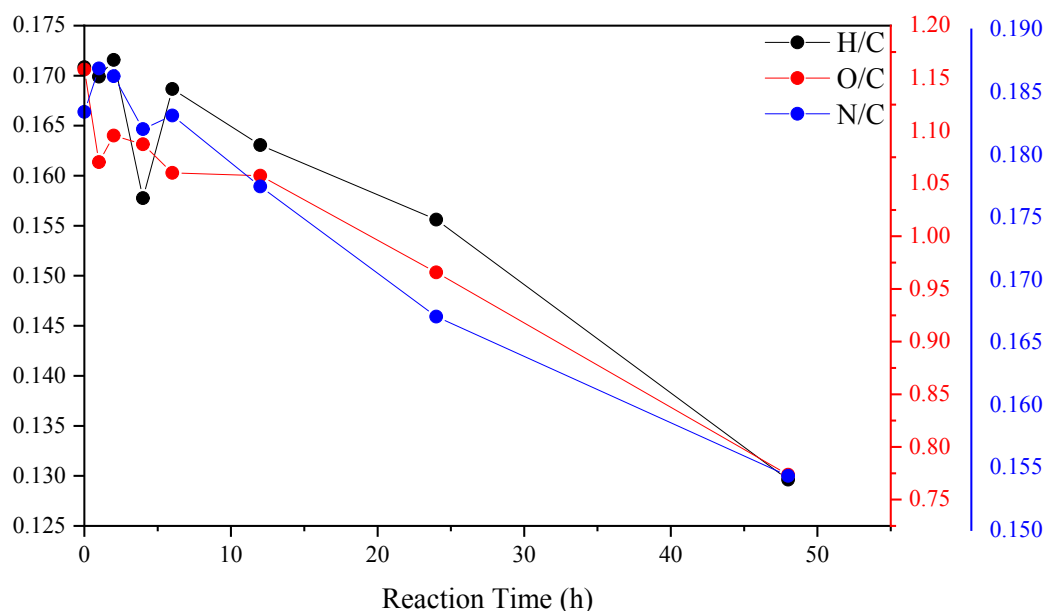


Figure S1. H/C, O/C, and N/C atomic ratios of the HTC chitosan materials as a function of treatment time.

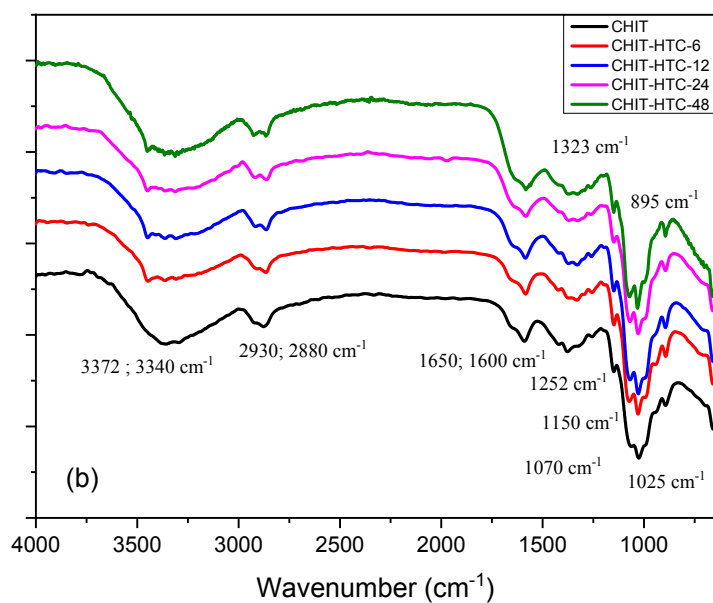
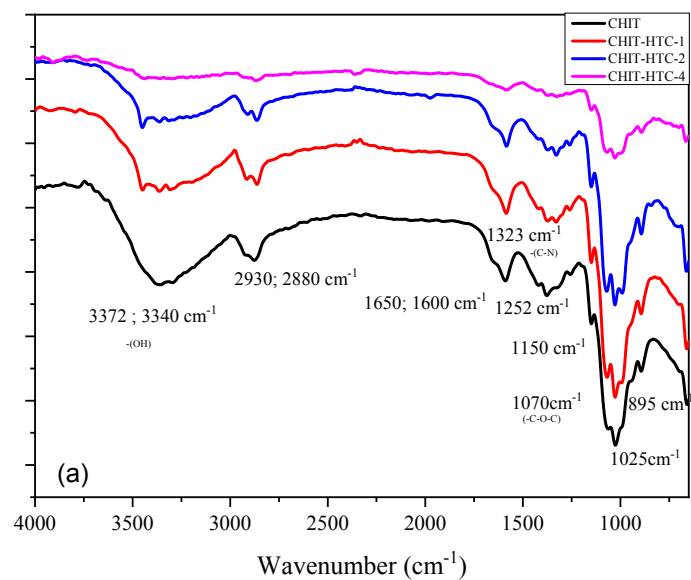


Figure S2. FTIR spectra of chitosan and HTC samples **a)** Chitosan, HTC-1, HTC-2, HTC-4 and HTC-6; **b)** Chitosan, HTC-12, HTC-24, HTC-48.

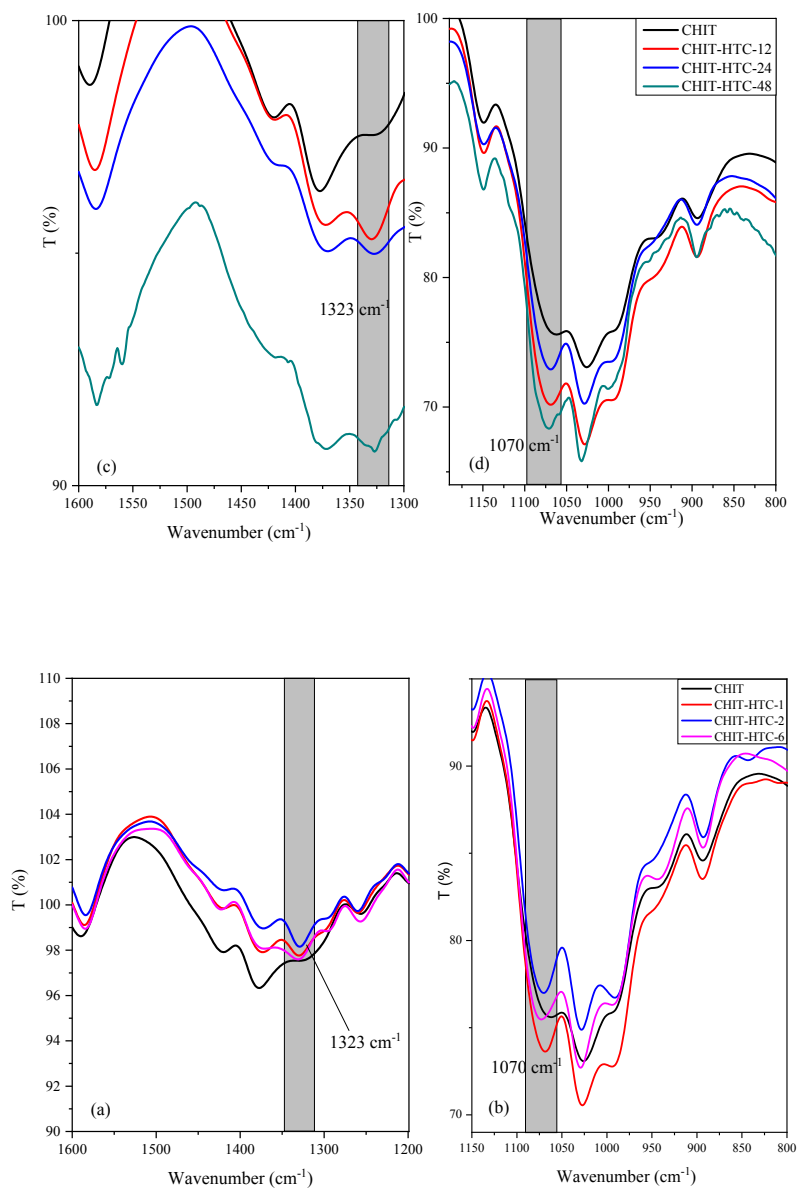


Figure S3. Amplification of the regions in the FTIR spectra of chitosan and HTC samples: 1600-1200 cm⁻¹ (a) and 1150-800 cm⁻¹(b).

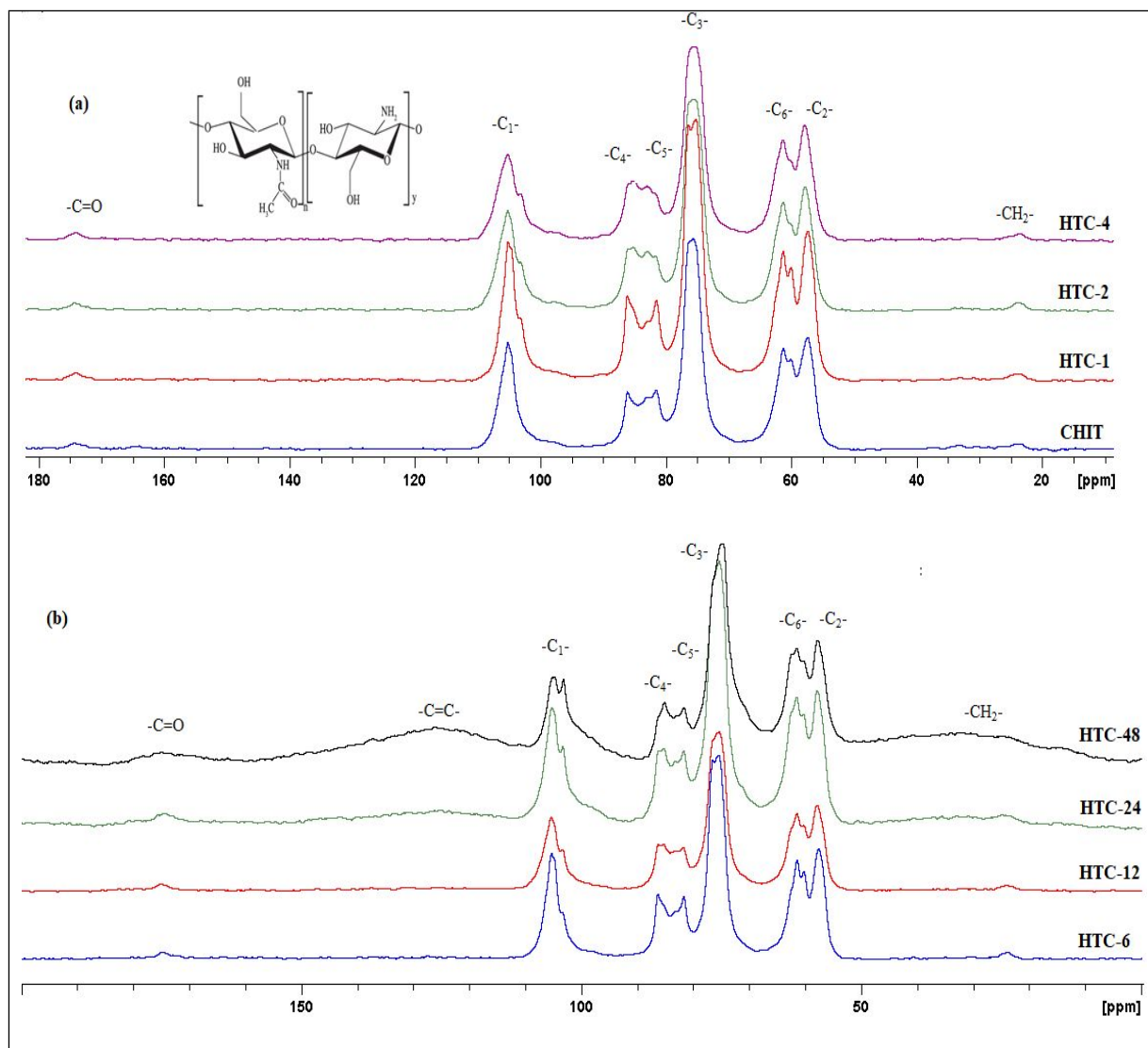


Figure S4. ^{13}C CP-MAS/NMR spectra of (a) Chitosan, CHIT-HTC-1, CHIT-HTC-2, CHIT-HTC-4 and (b) CHIT-HTC-6, CHIT-HTC-12, CHIT-HTC-24, and CHIT-HTC-48.

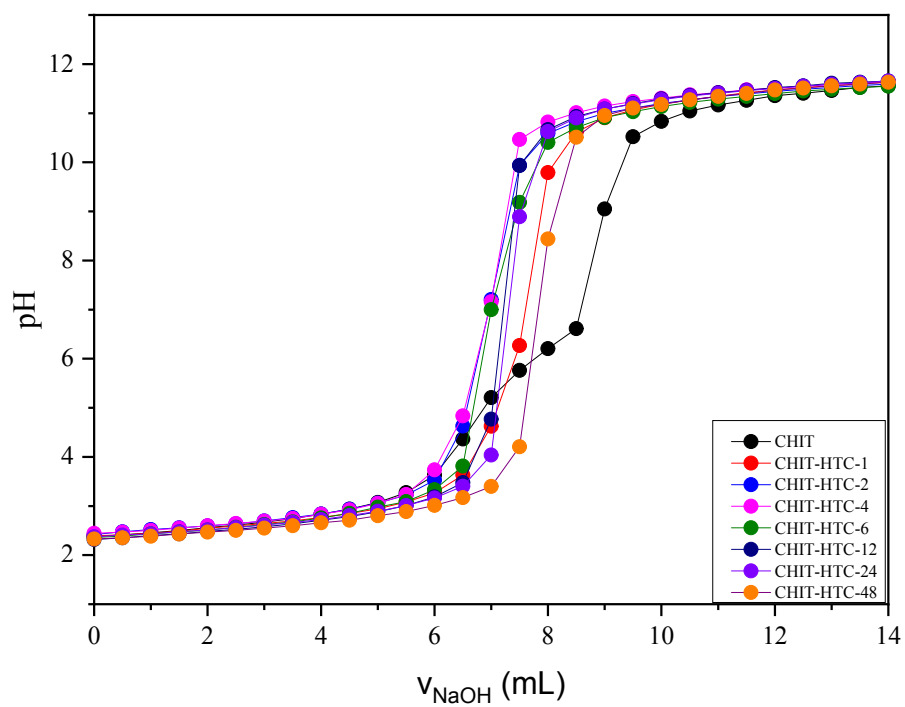


Figure S5. Potentiometric titration curves of chitosan and HTC samples.

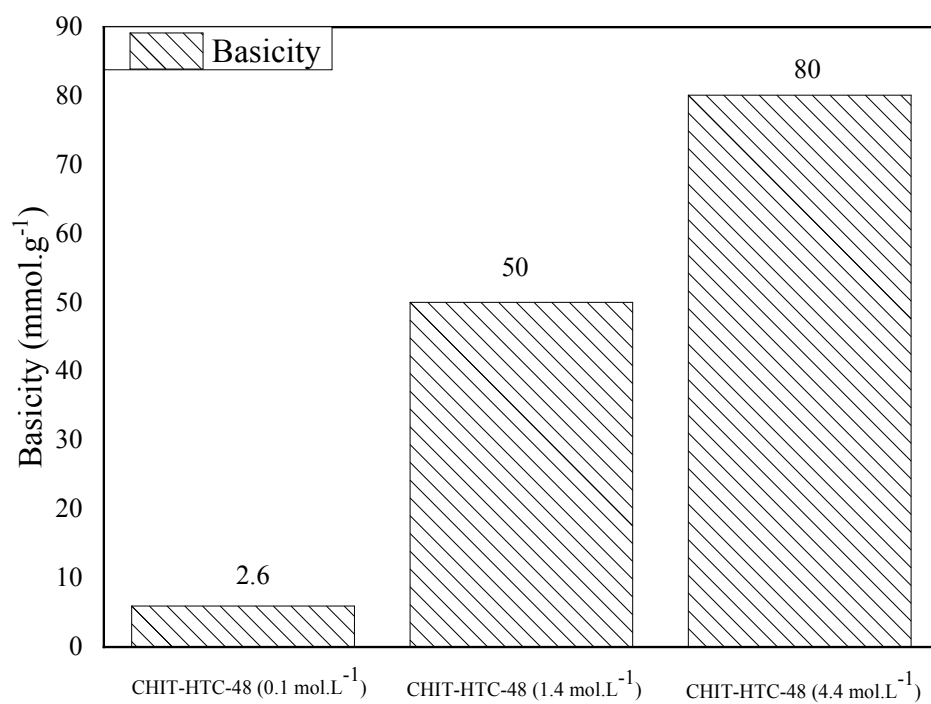


Figure S6. Basicity of the CHIT-HTC-48 material with different HCl concentrations.

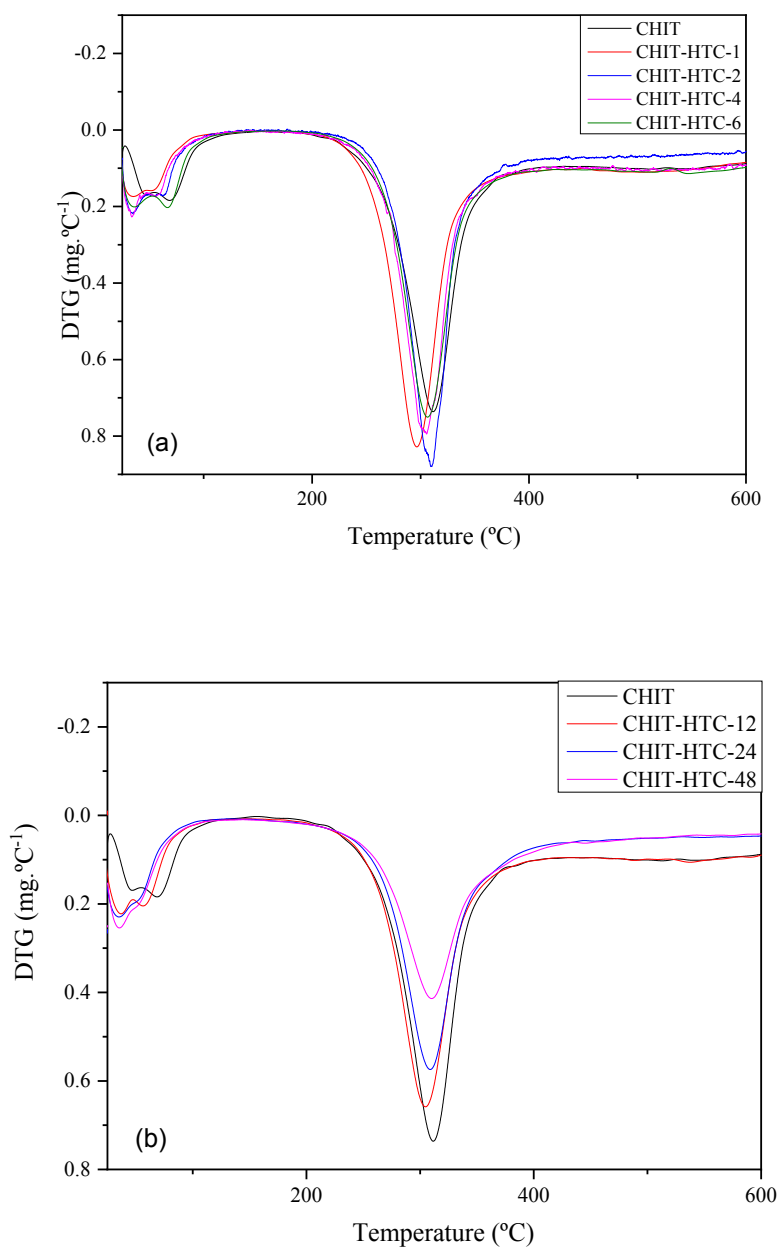


Figure S7. DTG curves: a) Chitosan, CHIT-HTC-1, CHIT-HTC-2, CHIT-HTC-4, CHIT-HTC-6; b) Chitosan, CHIT-HTC-12, CHIT-HTC-24, CHIT-HTC-48.

Table S1. Weight loss and temperature correspond to the maximum loss in each step for chitosan and HTC samples.

Sample	Weight Loss (%)	
	First Step	Second Step
CHIT	10.0	47.0
CHIT-HTC-1	9.0	50.0
CHIT-HTC-2	10.5	45.2
CHIT-HTC-4	10.3	46.4
CHIT-HTC-6	12.0	45.8
CHIT-HTC-12	12.0	44.2
CHIT-HTC-24	12.2	38.0
CHIT-HTC-48	13.2	31.1

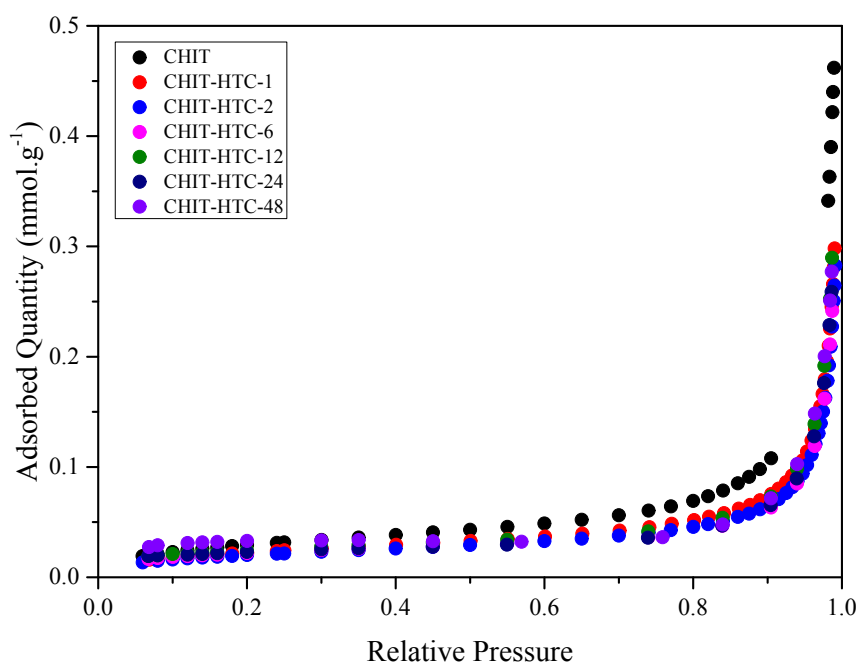


Figure S8. Nitrogen adsorption isotherms of chitosan and the HTC materials.

Table S2. Textural Properties of the HTC samples.

Sample	BET Area (m².g⁻¹)
CHIT	2.2
CHIT-HTC-1	1.9
CHIT-HTC-2	1.7
CHIT-HTC-6	2.0
CHIT-HTC-12	2.0
CHIT-HTC-24	1.8
CHIT-HTC-48	2.6