

Supplementary material for

**Optimization of chemically activated carbon derived from malt bagasse for CO₂
adsorption: a simplex centroid approach**

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Table S1. Model summary statistics.

Source	Std. Dev. (10^{-8})	R ²	Adjusted R ²
Linear	9.15	0.2438	0.1780
Quadratic	8.05	0.4908	0.3635
Special Cubic	8.24	0.4936	0.3337
Cubic	6.57	0.7285	0.5759

Table S2. Analysis of variance (ANOVA).

Terms	Quadratic Sum	Degrees of freedom	Quadratic mean	F-value	p-value
Model	5.04×10^5	9	55963.07	4.86	0.0030
Linear mixture	1.69×10^5	2	84535.66	7.35	0.0054
x_1x_2	1.17×10^5	1	1.17×10^5	10.15	0.0058
x_1x_3	73641.12	1	73641.12	6.40	0.0223
x_2x_3	1438.45	1	1438.45	0.13	0.7283
$x_1x_2x_3$	1952.80	1	1952.80	0.17	0.6858
$x_1x_2(x_1 - x_2)$	3446.46	1	3446.46	0.30	0.5917
$x_1x_3(x_1 - x_3)$	1.22×10^5	1	1.22×10^5	10.60	0.0050
$x_2x_3(x_2 - x_3)$	18229.00	1	18229.00	1.58	0.2262
Residual	1.84×10^5	16	11504.74		
Total	6.87×10^5	25			
CV (%)	24.7				

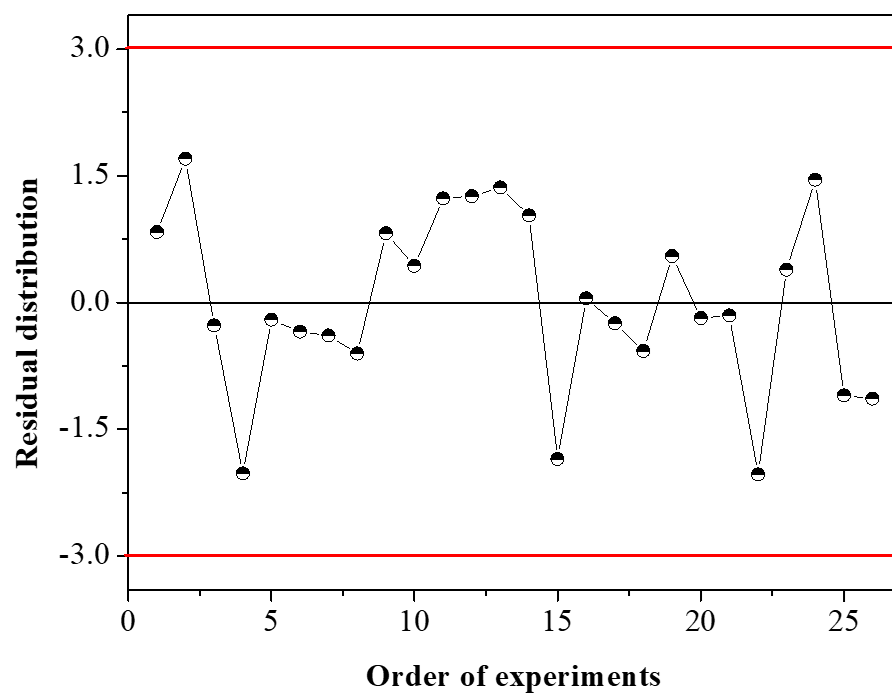


Figure S1. Plot of residuals versus order of experiments.

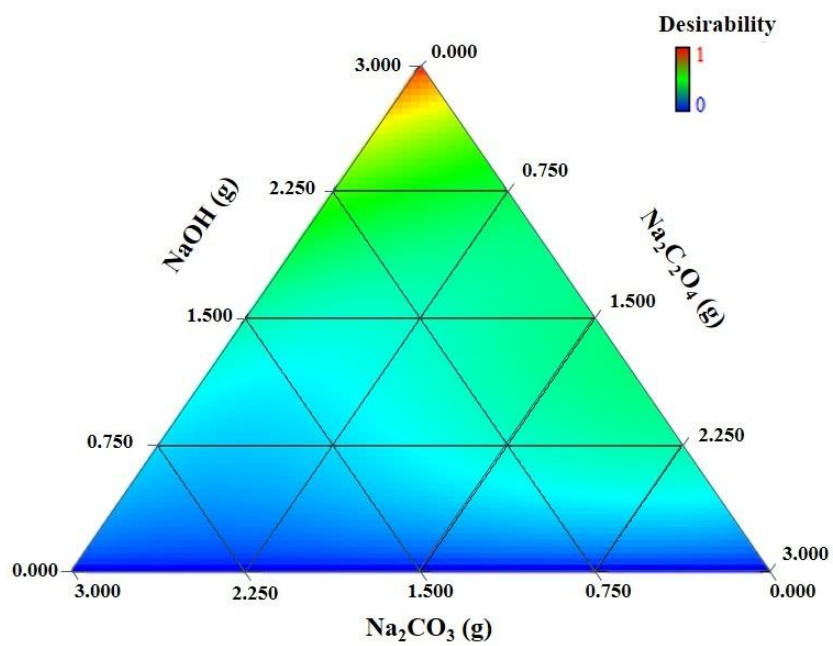


Figure S2. Desirability plot.

Table S3. I_D/I_G and L_a of the carbonized material and of the AC_{op}.

	Carbonized material	AC_{op}
I_D/I_G	0.95	1.02
$L_a(nm)$	19.96	18.65

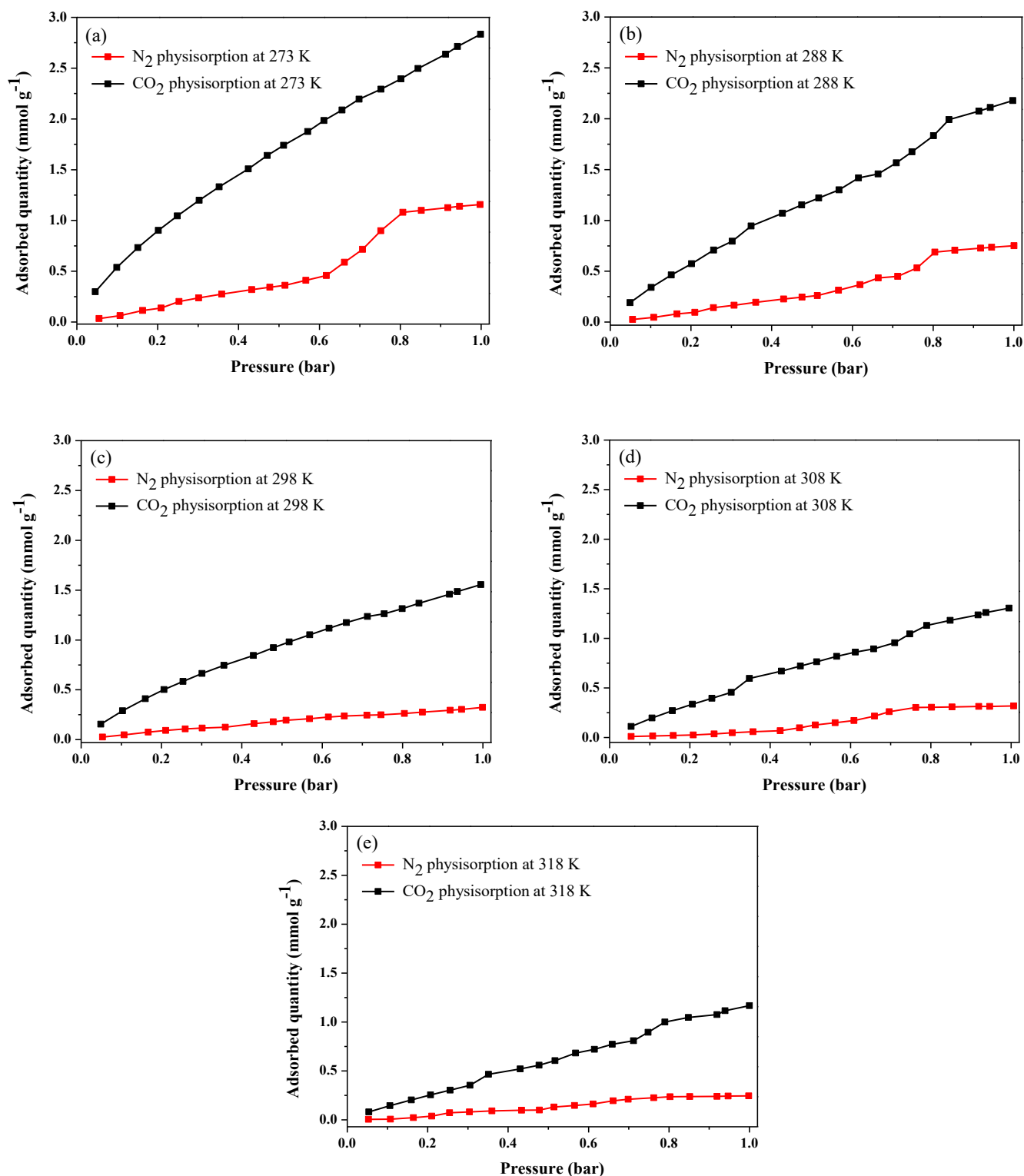


Figure S3. N₂ and CO₂ adsorption isotherms for AC_{op} at temperatures (a) 273 K, (b) 288 K, (c) 298 K, (d) 308 K, (e) 318 K.