

Supplementary Information

Hydrothermal synthesis of nitrogen-doped ordered mesoporous carbon via lysine-assisted self-assembly for efficient CO₂ capture

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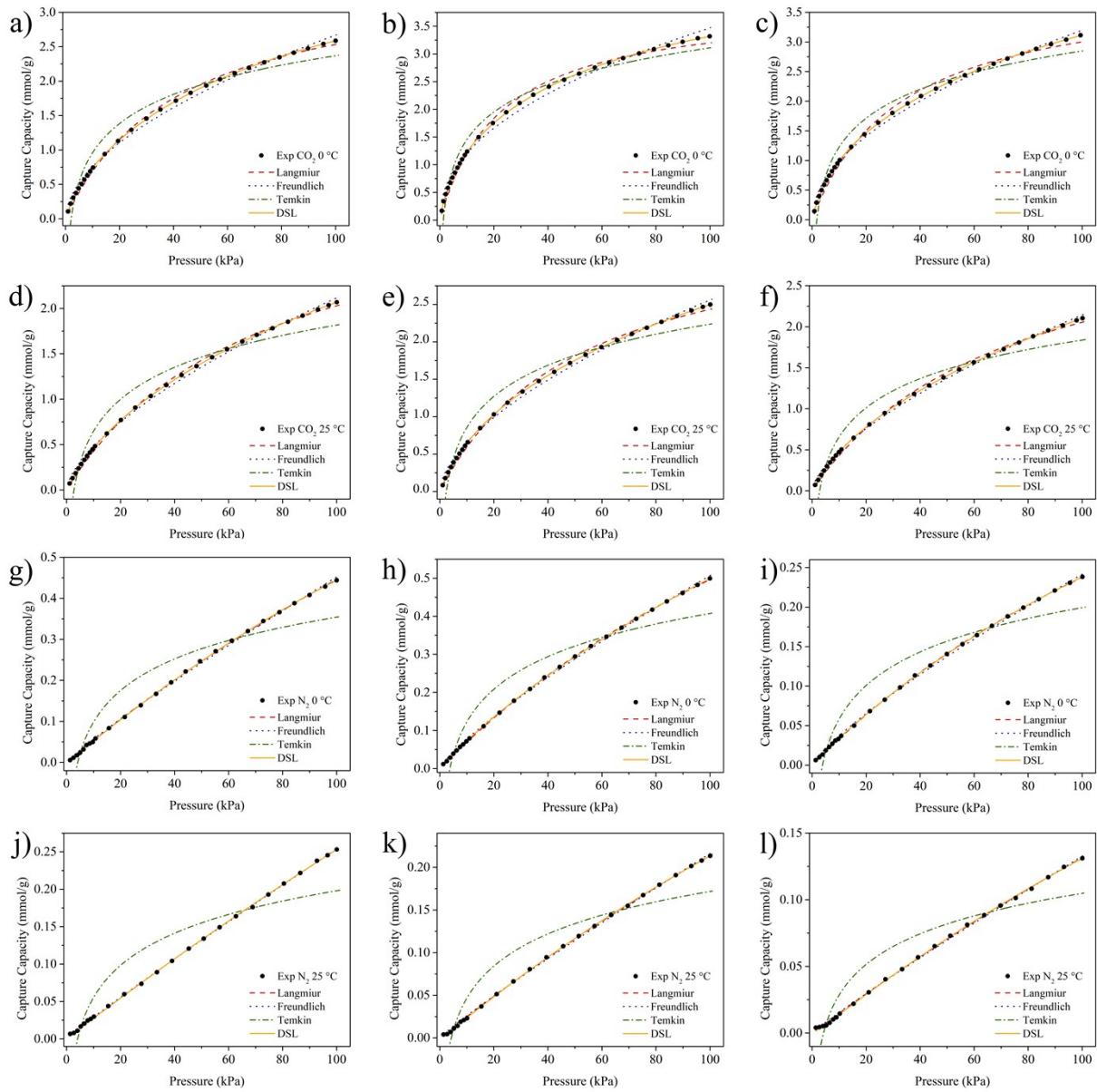


Fig. S1. Experimental equilibrium data (points) and adsorption isotherm model (curves) of NOMC-L, NOMC-L-0.5, and NOMC-L-1 for CO_2 adsorption at $0\text{ }^\circ\text{C}$ (a) (b) (c) and $25\text{ }^\circ\text{C}$ (d) (e) (f); for N_2 adsorption at $0\text{ }^\circ\text{C}$ (g) (h) (i) and $25\text{ }^\circ\text{C}$ (j) (k) (l).

Table S1. Langmuir isotherm model parameters for pure CO₂ and N₂ adsorption on NOMCs at 0 °C and 25 °C.

Sample	Component	Temperature (°C)	Parameters		
			q _m (mmol/g)	k _L (1/kPa)	R ²
NOMC-L	CO ₂	0	3.60735	0.02359	0.99666
		25	3.49305	0.01386	0.9981
	N ₂	0	2.36403	0.00233	0.9998
		25	2.0280	0.00098	0.99966
NOMC-L-0.5	CO ₂	0	3.92639	0.04402	0.9932
		25	3.71623	0.019	0.99682
	N ₂	0	1.55582	0.00468	0.99979
		25	1.40711	0.00179	0.99967
NOMC-L-1	CO ₂	0	3.89992	0.03006	0.99241
		25	3.55501	0.0137	0.99735
	N ₂	0	0.9942	0.00466	0.99986
		25	0.74768	0.00152	0.9994

Table S2. Freundlich isotherm model parameters for pure CO₂ and N₂ adsorption on NOMCs at 0 °C and 25 °C.

Sample	Component	Temperature (°C)	Parameters		
			k _F (mmol/(g·kPa ^{1/n}))	n	R ²
NOMC-L	CO ₂	0	0.21414	1.82541	0.9943
		25	0.10873	1.55118	0.99723
	N ₂	0	0.00715	1.11053	0.99897
		25	0.00329	1.05948	0.99982
NOMC-L-0.5	CO ₂	0	0.42009	2.18073	0.99115
		25	0.1691	1.69467	0.99611
	N ₂	0	0.01178	1.22422	0.99922
		25	0.00311	1.08633	0.99901
NOMC-L-1	CO ₂	0	0.30429	1.95801	0.99563
		25	0.11001	1.55072	0.99794
	N ₂	0	0.00572	1.22997	0.99893
		25	0.00182	1.07316	0.99886

Table S3. Temkin isotherm model parameters for pure CO₂ and N₂ adsorption on NOMCs at 0 °C and 25 °C.

Sample	Component	Temperature (°C)	Parameters		
			k _T (mmol/(g·kPa))	B	R ²
NOMC-L	CO ₂	0	0.47711	0.61304	0.9435
		25	0.35844	0.50748	0.92038
	N ₂	0	0.24224	0.1111	0.85484
		25	0.21453	0.06193	0.83018
NOMC-L-0.5	CO ₂	0	0.75334	0.71958	0.96124
		25	0.41704	0.59966	0.93618
	N ₂	0	0.27002	0.12362	0.87246
		25	0.23538	0.05434	0.85184
NOMC-L-1	CO ₂	0	0.56819	0.70483	0.94955
		25	0.35938	0.51307	0.91986
	N ₂	0	0.25949	0.06122	0.87465
		25	0.23744	0.03309	0.84095

Table S4. DSL isotherm model parameters for pure CO₂ and N₂ adsorption on NOMCs at 0 °C and 25 °C.

Sample	Component	e (°C)	Temperatur		Parameters		R ²
			q _{m,1} (mmol/g)	q _{m,2} (mmol/g)	b ₁ (1/kPa)	b ₂ (1/kPa)	
NOMC-L	CO ₂	0	4.41000	1.34427	0.00479	0.06743	0.99994
		25	3.59999	1.21849	0.00465	0.02875	0.99998
	N ₂	0	1.79341	0.57041	0.00233	0.00233	0.99985
		25	1.39999	0.39999	0.00126	0.00151	0.99978
NOMC-L-0.5	CO ₂	0	4.9100	1.93001	0.00630	0.10600	0.99989
		25	3.74985	1.81709	0.00375	0.0406	0.99998
	N ₂	0	2.02946	0.05304	0.00290	0.04147	0.99998
		25	1.40663	0.00039	0.00179	0.00179	0.99979
NOMC-L-1	CO ₂	0	4.73226	1.50000	0.00583	0.09665	0.99996
		25	3.62403	1.40000	0.00397	0.02895	0.99999
	N ₂	0	1.13500	0.13106	0.00168	0.0134	0.99995
		25	0.99286	0.00131	0.00152	0.00152	0.99948