

Supplementary information

Equilibrium adsorption behaviour of a 3D-Printed zeolite-geopolymer composite with high faujasitic content

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Table S1. CO₂ adsorption isotherms on 3DZGC at 298.15 K.

Run 1		Run 2		Run 3	
Pressure (kPa)	Adsorbed amount (mol/kg)	Pressure (kPa)	Adsorbed amount (mol/kg)	Pressure (kPa)	Adsorbed amount (mol/kg)
6.73278	1.69156	6.62612	1.82952	6.71945	1.42089
13.34557	2.36818	13.22558	2.28691	13.31890	1.98925
26.58448	2.70650	26.58448	2.75774	26.46449	2.26051
46.30286	2.97715	46.72949	3.02679	46.36952	2.51885
66.51453	2.97715	66.36788	3.22857	66.75451	2.77719
99.51182	3.31546	99.41849	3.29583	99.20518	2.97095

Table S2. CO₂ adsorption isotherms on 3DZGC at 318.15 K.

Run 1		Run 2		Run 3	
Pressure (kPa)	Adsorbed amount (mol/kg)	Pressure (kPa)	Adsorbed amount (mol/kg)	Pressure (kPa)	Adsorbed amount (mol/kg)
6.67943	1.25424	6.63944	1.10768	6.63944	1.11106
13.51885	1.58430	13.31887	1.66151	13.30554	1.80547
26.81105	1.98037	26.58441	1.86920	26.46442	1.94436
46.78269	2.44246	46.34273	2.21535	46.48938	2.43045
69.46076	2.57449	66.26103	2.49227	66.08772	2.84709
99.27156	2.90455	99.33822	2.90765	99.31156	2.84709

Table S3. CO₂ adsorption isotherms on 3DZGC at 338.15 K.

Run 1		Run 2		Run 3	
Pressure (kPa)	Adsorbed amount (mol/kg)	Pressure (kPa)	Adsorbed amount (mol/kg)	Pressure (kPa)	Adsorbed amount (mol/kg)
6.66610	0.96267	6.63944	1.10353	6.66610	0.89662
18.95839	1.30648	13.38553	1.65530	13.27887	1.24147
26.69106	1.78781	26.46442	2.06912	26.62440	1.65530
46.40939	2.06286	46.40939	2.27603	46.52938	2.06912
66.43435	2.47543	66.78099	2.55191	66.48768	2.34500
99.52487	2.68172	99.24490	2.82780	99.17824	2.62088

Table S4. Water vapour adsorption isotherms on 3DZGC at 298.15 K.

Run 1		Run 2		Run 3	
Pressure (kPa)	Adsorbed amount (mol/kg)	Pressure (kPa)	Adsorbed amount (mol/kg)	Pressure (kPa)	Adsorbed amount (mol/kg)
0.00467	1.66712	0.00333	3.01548	0.01160	1.94971
0.05186	6.94632	0.09746	7.61051	0.03893	7.64887
0.43090	9.16914	0.47009	8.61567	0.43663	9.44861
0.75300	10.28055	0.75900	9.33364	0.74020	10.04852
1.03231	11.25304	1.02538	9.33364	1.03325	10.04852
1.27536	11.25304	1.30189	9.33364	1.29949	10.19849

Table S5. Water vapour adsorption isotherms on 3DZGC at 318.15 K.

Run 1		Run 2		Run 3	
Pressure (kPa)	Adsorbed amount (mol/kg)	Pressure (kPa)	Adsorbed amount (mol/kg)	Pressure (kPa)	Adsorbed amount (mol/kg)
0.01240	2.37358	0.01333	1.61459	0.01333	1.78019
0.08119	6.23065	0.08053	5.87124	0.08346	5.93395
0.45010	7.86249	0.44636	7.33905	0.44143	7.86249
0.76314	8.15919	0.76820	7.33905	0.76394	7.86249
1.04204	8.15919	1.03551	7.33905	1.03711	8.15919
1.28282	8.15919	1.30136	7.33905	1.30336	8.15919

Table S6. Water vapour adsorption isotherms on 3DZGC at 338.15 K.

Run 1		Run 2		Run 3	
Pressure (kPa)	Adsorbed amount (mol/kg)	Pressure (kPa)	Adsorbed amount (mol/kg)	Pressure (kPa)	Adsorbed amount (mol/kg)
0.01613	1.32460	0.03386	1.17742	0.01640	1.61896
0.11026	4.85687	0.09519	5.00405	0.09439	5.29840
0.43996	6.47583	0.47089	6.77018	0.45863	6.62300
0.77047	6.62300	0.79753	6.91736	0.79327	6.91736
1.05271	6.77018	1.07071	6.91736	1.04044	6.91736
1.29869	6.77018	1.33455	6.91736	1.32015	6.91736