

# **Sour gas adsorption on silica gels**

## **Supporting Information**

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**Table S1.** Methane adsorption data for the 22 Å pore size silica.

$p$ /bar	$n^{\text{abs}}$ /mmol g <sup>-1</sup>	$n^{\text{exc}}$ /mmol g <sup>-1</sup>
$T = -0.0219 \pm 0.006 \text{ } ^\circ\text{C}$		
2.6990	0.527	0.432 ± 0.002
5.5644	0.963	0.766 ± 0.004
8.4473	1.342	1.041 ± 0.006
11.2993	1.677	1.272 ± 0.008
14.0792	1.979	1.471 ± 0.010
16.7775	2.253	1.644 ± 0.012
19.3844	2.504	1.795 ± 0.014
21.8833	2.736	1.931 ± 0.016
24.2856	2.950	2.051 ± 0.018
26.6113	3.143	2.152 ± 0.019
28.8134	3.329	2.250 ± 0.021
30.9239	3.501	2.337 ± 0.022
32.9433	3.661	2.415 ± 0.024
34.8731	3.811	2.486 ± 0.025
36.7109	3.954	2.552 ± 0.026
38.4679	4.087	2.611 ± 0.028
40.1464	4.212	2.665 ± 0.029
41.7477	4.330	2.715 ± 0.030
43.2705	4.442	2.763 ± 0.031
44.7289	4.548	2.805 ± 0.032
46.1237	4.647	2.843 ± 0.033
47.4494	4.742	2.880 ± 0.034
48.7117	4.832	2.914 ± 0.035
49.9200	4.917	2.946 ± 0.036
51.0725	4.999	2.976 ± 0.037
52.1757	5.075	3.003 ± 0.038
53.2238	5.149	3.029 ± 0.039
54.2268	5.218	3.053 ± 0.039
55.1844	5.284	3.076 ± 0.04
56.0970	5.348	3.097 ± 0.041
56.9708	5.407	3.117 ± 0.041
59.1140	5.554	3.164 ± 0.043
61.1536	5.692	3.207 ± 0.044
63.0990	5.821	3.245 ± 0.046
64.9447	5.946	3.282 ± 0.047
66.7042	6.062	3.314 ± 0.048
68.3765	6.174	3.345 ± 0.050

**Table S1.** Continued.

$p$ /bar	$\eta^{\text{abs}}$ /mmol g <sup>-1</sup>	$\eta^{\text{exc}}$ /mmol g <sup>-1</sup>
$T = -0.0219 \pm 0.006 \text{ }^\circ\text{C}$		
69.9725	6.279	3.373 $\pm$ 0.051
71.4911	6.377	3.395 $\pm$ 0.053
72.9392	6.472	3.419 $\pm$ 0.054
74.3203	6.563	3.442 $\pm$ 0.055
75.6355	6.650	3.464 $\pm$ 0.056
76.8928	6.732	3.483 $\pm$ 0.058
78.0879	6.811	3.502 $\pm$ 0.058
79.2317	6.884	3.517 $\pm$ 0.059
80.3185	6.956	3.534 $\pm$ 0.060
81.3590	7.024	3.549 $\pm$ 0.061
82.3511	7.090	3.566 $\pm$ 0.062
83.3096	7.148	3.574 $\pm$ 0.062
84.2134	7.206	3.586 $\pm$ 0.063
85.0781	7.262	3.597 $\pm$ 0.064
85.9109	7.313	3.606 $\pm$ 0.065
86.6986	7.364	3.616 $\pm$ 0.066
$T = 0.096 \pm 0.005 \text{ }^\circ\text{C}$		
1.4712	0.314	0.262 $\pm$ 0.002
3.0178	0.583	0.477 $\pm$ 0.002
4.5740	0.824	0.663 $\pm$ 0.003
6.1196	1.041	0.824 $\pm$ 0.005
7.6384	1.239	0.968 $\pm$ 0.006
9.1186	1.422	1.097 $\pm$ 0.007
10.5624	1.591	1.213 $\pm$ 0.008
11.9575	1.748	1.319 $\pm$ 0.009
13.3109	1.894	1.414 $\pm$ 0.010
14.6146	2.030	1.502 $\pm$ 0.011
15.8744	2.157	1.582 $\pm$ 0.012
17.0859	2.277	1.656 $\pm$ 0.013
18.2524	2.389	1.724 $\pm$ 0.013
19.3727	2.495	1.787 $\pm$ 0.014
20.4516	2.594	1.845 $\pm$ 0.015
21.4745	2.691	1.902 $\pm$ 0.016
22.4655	2.780	1.953 $\pm$ 0.016
23.4199	2.863	1.999 $\pm$ 0.017
24.3278	2.944	2.044 $\pm$ 0.018
25.1987	3.020	2.086 $\pm$ 0.018

**Table S1.** Continued.

$p$ /bar	$\eta^{\text{abs}}$ /mmol g <sup>-1</sup>	$\eta^{\text{exc}}$ /mmol g <sup>-1</sup>
$T = 0.096 \pm 0.005 \text{ }^\circ\text{C}$		
26.0657	3.084	2.116 $\pm$ 0.019
26.8636	3.153	2.153 $\pm$ 0.019
27.6316	3.218	2.187 $\pm$ 0.020
28.3696	3.279	2.219 $\pm$ 0.021
29.0745	3.337	2.249 $\pm$ 0.021
29.7524	3.392	2.276 $\pm$ 0.022
30.4012	3.444	2.303 $\pm$ 0.022
31.0224	3.494	2.327 $\pm$ 0.022
31.6175	3.541	2.350 $\pm$ 0.023
32.1882	3.586	2.372 $\pm$ 0.023
32.7319	3.630	2.393 $\pm$ 0.024
35.0374	3.808	2.477 $\pm$ 0.025
37.2290	3.977	2.555 $\pm$ 0.026
39.3277	4.133	2.623 $\pm$ 0.028
41.3266	4.281	2.685 $\pm$ 0.029
43.2286	4.421	2.744 $\pm$ 0.031
45.0449	4.552	2.796 $\pm$ 0.032
$T = 25.071 \pm 0.008 \text{ }^\circ\text{C}$		
2.1887	0.299	0.229 $\pm$ 0.002
4.3988	0.561	0.419 $\pm$ 0.003
6.5784	0.797	0.584 $\pm$ 0.004
8.6963	1.015	0.733 $\pm$ 0.004
10.6961	1.229	0.882 $\pm$ 0.005
12.6170	1.433	1.021 $\pm$ 0.006
14.4527	1.628	1.155 $\pm$ 0.007
$T = 25.074 \pm 0.005 \text{ }^\circ\text{C}$		
0.6018	0.087	0.068 $\pm$ 0.002
1.1904	0.168	0.130 $\pm$ 0.002
2.9116	0.387	0.294 $\pm$ 0.003
4.6154	0.585	0.436 $\pm$ 0.004
6.2852	0.766	0.563 $\pm$ 0.004
7.9128	0.933	0.677 $\pm$ 0.004
10.4210	1.176	0.837 $\pm$ 0.005
12.8603	1.397	0.977 $\pm$ 0.007
15.2217	1.601	1.102 $\pm$ 0.007
17.4948	1.791	1.216 $\pm$ 0.008
19.6724	1.971	1.321 $\pm$ 0.009

**Table S1.** Continued.

$p$ /bar	$\eta^{\text{abs}}$ /mmol g <sup>-1</sup>	$\eta^{\text{exc}}$ /mmol g <sup>-1</sup>
	$T = 25.074 \pm 0.005 \text{ }^\circ\text{C}$	
21.7862	2.134	1.412 ± 0.010
23.8380	2.282	1.489 ± 0.011
25.7688	2.429	1.569 ± 0.012
28.4390	2.621	1.668 ± 0.013
30.9898	2.803	1.759 ± 0.014
33.4398	2.970	1.839 ± 0.015
35.7853	3.128	1.912 ± 0.016
38.0240	3.277	1.980 ± 0.017
40.1629	3.417	2.043 ± 0.018
42.2178	3.548	2.098 ± 0.019
44.1741	3.673	2.151 ± 0.020
46.0508	3.789	2.197 ± 0.021
47.8386	3.900	2.242 ± 0.021
49.5502	4.005	2.283 ± 0.022
51.1839	4.105	2.321 ± 0.023
52.7506	4.199	2.355 ± 0.024
54.2442	4.288	2.388 ± 0.024
56.3853	4.416	2.433 ± 0.025
58.4225	4.537	2.476 ± 0.026
60.3727	4.652	2.515 ± 0.027
62.2321	4.761	2.552 ± 0.028
64.0200	4.862	2.583 ± 0.029
65.7160	4.961	2.615 ± 0.029
67.3472	5.051	2.641 ± 0.030
68.9009	5.139	2.667 ± 0.031
70.3972	5.219	2.688 ± 0.032
71.8035	5.301	2.714 ± 0.032
73.1665	5.375	2.733 ± 0.033
74.4377	5.455	2.762 ± 0.034
75.6680	5.525	2.782 ± 0.034
76.8533	5.590	2.799 ± 0.035
77.9760	5.654	2.818 ± 0.035
79.0576	5.714	2.834 ± 0.036
80.0923	5.770	2.848 ± 0.036
81.0836	5.823	2.861 ± 0.037
82.0270	5.876	2.874 ± 0.037
82.9343	5.924	2.886 ± 0.038

**Table S1.** Continued.

$p$ /bar	$\eta^{\text{abs}}$ /mmol g <sup>-1</sup>	$\eta^{\text{exc}}$ /mmol g <sup>-1</sup>
$T = 25.074 \pm 0.005 \text{ } ^\circ\text{C}$		
83.8025	5.970	2.896 ± 0.038
84.6024	6.022	2.916 ± 0.038
85.3828	6.069	2.930 ± 0.039
86.1467	6.107	2.937 ± 0.039
86.8815	6.144	2.943 ± 0.039
87.5743	6.181	2.952 ± 0.040
88.2367	6.217	2.960 ± 0.040
88.8569	6.255	2.973 ± 0.040
90.1854	6.327	2.989 ± 0.041
91.4525	6.395	3.005 ± 0.042
92.6699	6.459	3.018 ± 0.042
$T = 50.24 \pm 0.01 \text{ } ^\circ\text{C}$		
2.8858	0.280	0.175 ± 0.002
5.7391	0.529	0.320 ± 0.003
8.5108	0.757	0.446 ± 0.004
11.1968	0.966	0.556 ± 0.005
13.7846	1.160	0.655 ± 0.006
16.2728	1.342	0.752 ± 0.007
18.8290	1.484	0.799 ± 0.008
21.1826	1.637	0.864 ± 0.008
23.3988	1.789	0.933 ± 0.009
25.5418	1.929	0.992 ± 0.010
27.5969	2.060	1.045 ± 0.011
29.5545	2.186	1.101 ± 0.012
31.5363	2.286	1.127 ± 0.013
33.3648	2.395	1.166 ± 0.013
35.1229	2.497	1.200 ± 0.014
36.7940	2.596	1.235 ± 0.015
38.3595	2.697	1.275 ± 0.015
39.8914	2.785	1.306 ± 0.016
41.4246	2.856	1.319 ± 0.017
42.8411	2.935	1.342 ± 0.017
44.1879	3.012	1.366 ± 0.017
45.4863	3.082	1.386 ± 0.018
46.6807	3.160	1.416 ± 0.019
47.8430	3.229	1.441 ± 0.019
49.0536	3.275	1.440 ± 0.019

**Table S1.** Continued.

$p$ /bar	$\eta^{\text{abs}}$ /mmol g <sup>-1</sup>	$\eta^{\text{exc}}$ /mmol g <sup>-1</sup>
	$T = 50.24 \pm 0.01 \text{ } ^\circ\text{C}$	
50.1395	3.334	$1.457 \pm 0.020$
51.1834	3.390	$1.471 \pm 0.020$
52.1412	3.452	$1.494 \pm 0.021$
53.0668	3.508	$1.514 \pm 0.021$
53.9456	3.564	$1.534 \pm 0.021$
54.7872	3.617	$1.556 \pm 0.022$
55.7719	3.629	$1.530 \pm 0.022$
56.5715	3.672	$1.541 \pm 0.023$
57.3418	3.712	$1.550 \pm 0.023$
58.0743	3.751	$1.560 \pm 0.023$
	$T = 50.241 \pm 0.005 \text{ } ^\circ\text{C}$	
3.2712	0.313	$0.216 \pm 0.002$
6.4908	0.592	$0.400 \pm 0.003$
9.6352	0.844	$0.557 \pm 0.005$
12.6908	1.076	$0.696 \pm 0.007$
15.6515	1.286	$0.816 \pm 0.008$
18.4746	1.487	$0.931 \pm 0.010$
21.2209	1.667	$1.026 \pm 0.011$
23.8189	1.843	$1.121 \pm 0.013$
26.3295	2.005	$1.204 \pm 0.014$
28.8081	2.145	$1.266 \pm 0.016$
31.1274	2.287	$1.335 \pm 0.017$
33.3372	2.424	$1.401 \pm 0.018$
35.4432	2.554	$1.464 \pm 0.019$
37.4517	2.679	$1.524 \pm 0.020$

**Table S2.** Carbon dioxide adsorption data for the 22 Å pore size silica.

$p$ /bar	$n^{\text{abs}}$ /mmol g <sup>-1</sup>	$n^{\text{exc}}$ /mmol g <sup>-1</sup>
$T = -0.003 \pm 0.008 \text{ } ^\circ\text{C}$		
0.4944	1.126	1.102 ± 0.009
1.1402	1.904	1.849 ± 0.012
1.7719	2.462	2.376 ± 0.020
2.3373	2.868	2.754 ± 0.026
2.8100	3.173	3.036 ± 0.029
3.2037	3.399	3.242 ± 0.035
3.5231	3.570	3.397 ± 0.047
3.7781	3.701	3.515 ± 0.053
3.9733	3.806	3.610 ± 0.057
4.1340	3.884	3.680 ± 0.060
4.2604	3.943	3.733 ± 0.065
4.3527	3.994	3.779 ± 0.071
4.4307	4.030	3.811 ± 0.079
4.4957	4.06	3.83 ± 0.19
4.5469	4.08	3.85 ± 0.27
4.5844	4.09	3.87 ± 0.27
$T = -0.160 \pm 0.005 \text{ } ^\circ\text{C}$		
0.1647	0.577	0.569 ± 0.007
0.4028	0.996	0.977 ± 0.006
0.6225	1.324	1.294 ± 0.008
0.8283	1.573	1.533 ± 0.013
1.0012	1.772	1.724 ± 0.018
1.6829	2.385	2.303 ± 0.021
3.6745	3.693	3.513 ± 0.036
5.5427	4.503	4.227 ± 0.054
7.0751	5.052	4.695 ± 0.070
8.2892	5.432	5.011 ± 0.083
9.2403	5.699	5.225 ± 0.094
9.9626	5.90	5.38 ± 0.10
$T = 25.063 \pm 0.005 \text{ } ^\circ\text{C}$		
8.8023	3.753	3.348 ± 0.015
17.0866	5.324	4.499 ± 0.033
23.1683	6.234	5.069 ± 0.044
27.5162	6.806	5.380 ± 0.055
30.5997	7.203	5.578 ± 0.064
32.8074	7.480	5.707 ± 0.068
34.4205	7.659	5.773 ± 0.075



**Table S2.** Continued.

$p$ /bar	$\eta^{\text{abs}}$ /mmol g <sup>-1</sup>	$\eta^{\text{exc}}$ /mmol g <sup>-1</sup>
$T = 25.126 \pm 0.005 \text{ } ^\circ\text{C}$		
1.1153	1.041	$0.992 \pm 0.011$
2.2819	1.720	$1.618 \pm 0.022$
3.3298	2.177	$2.028 \pm 0.030$
4.1811	2.512	$2.325 \pm 0.038$
4.8806	2.747	$2.528 \pm 0.044$
5.4395	2.916	$2.671 \pm 0.052$
6.4208	3.211	$2.920 \pm 0.062$
7.1986	3.421	$3.093 \pm 0.069$
8.1592	3.660	$3.286 \pm 0.076$
8.8862	3.842	$3.433 \pm 0.084$
9.4553	3.970	$3.534 \pm 0.094$
9.8855	4.07	$3.61 \pm 0.11$
10.2253	4.14	$3.66 \pm 0.11$
10.4758	4.19	$3.70 \pm 0.11$
$T = 50.118 \pm 0.009 \text{ } ^\circ\text{C}$		
7.3743	2.215	$1.908 \pm 0.012$
13.8680	3.319	$2.725 \pm 0.023$
18.8626	3.986	$3.160 \pm 0.032$
22.5996	4.416	$3.409 \pm 0.040$
25.4181	4.691	$3.544 \pm 0.047$
27.4863	4.888	$3.634 \pm 0.052$
29.0142	5.026	$3.692 \pm 0.062$
$T = 50.149 \pm 0.005 \text{ } ^\circ\text{C}$		
13.4686	3.144	$2.568 \pm 0.028$
24.6418	4.523	$3.415 \pm 0.079$
33.1389	5.41	$3.86 \pm 0.11$
39.6268	6.02	$4.09 \pm 0.12$
44.3985	6.43	$4.21 \pm 0.30$
48.6582	6.74	$4.24 \pm 0.30$
51.7113	6.99	$4.28 \pm 0.14$
53.9346	7.18	$4.31 \pm 0.13$
55.5717	7.30	$4.31 \pm 0.13$
56.7508	7.40	$4.32 \pm 0.16$
57.6067	7.48	$4.33 \pm 0.20$

**Table S3.** Hydrogen sulfide adsorption data for the 22 Å pore size silica.

$p$ /bar	$n^{\text{abs}}$ /mmol g <sup>-1</sup>	$n^{\text{exc}}$ /mmol g <sup>-1</sup>
$T = 0.124 \pm 0.005$ °C		
0.0396	0.641	$0.639 \pm 0.007$
0.0904	1.173	$1.169 \pm 0.007$
0.1716	1.856	$1.848 \pm 0.007$
0.3112	2.388	$2.373 \pm 0.006$
0.4586	2.814	$2.792 \pm 0.009$
0.5934	3.160	$3.132 \pm 0.014$
0.8856	3.786	$3.743 \pm 0.016$
$T = 0.100 \pm 0.008$ °C		
0.0824	0.910	$0.906 \pm 0.009$
0.2071	1.646	$1.636 \pm 0.009$
0.3640	2.464	$2.447 \pm 0.009$
0.6517	3.194	$3.162 \pm 0.011$
0.9703	3.746	$3.699 \pm 0.014$
1.3600	4.306	$4.24 \pm 0.02$
1.7190	4.734	$4.65 \pm 0.026$
2.0208	5.439	$5.34 \pm 0.026$
2.4892	5.931	$5.809 \pm 0.031$
2.8946	6.308	$6.165 \pm 0.041$
3.3089	6.659	$6.495 \pm 0.044$
3.6277	6.947	$6.766 \pm 0.048$
3.8998	7.165	$6.97 \pm 0.052$
$T = 25.122 \pm 0.005$ °C		
0.3651	1.245	$1.229 \pm 0.005$
0.9520	2.121	$2.079 \pm 0.011$
1.5525	2.767	$2.698 \pm 0.016$
2.7351	3.718	$3.595 \pm 0.025$
3.8436	4.373	$4.199 \pm 0.035$
4.7643	4.856	$4.639 \pm 0.043$
$T = 25.115 \pm 0.005$ °C		
0.0874	0.434	$0.43 \pm 0.006$
0.1770	0.790	$0.782 \pm 0.004$
0.2964	1.136	$1.123 \pm 0.005$
0.4166	1.411	$1.393 \pm 0.011$
0.5337	1.629	$1.606 \pm 0.014$
0.6374	1.805	$1.777 \pm 0.021$
0.8537	2.114	$2.076 \pm 0.022$
1.0505	2.354	$2.308 \pm 0.021$

**Table S3.** Continued.

$p$ /bar	$\eta^{\text{abs}}$ /mmol g <sup>-1</sup>	$\eta^{\text{exc}}$ /mmol g <sup>-1</sup>
T = 50.179 ± 0.006 °C		
0.5883	0.894	0.87 ± 0.006
1.2949	1.507	1.455 ± 0.011
1.9486	1.954	1.875 ± 0.016
2.5206	2.281	2.177 ± 0.022
2.9972	2.526	2.402 ± 0.026
3.3898	2.707	2.566 ± 0.031
3.7022	2.845	2.692 ± 0.041
3.9532	2.950	2.786 ± 0.052
4.4015	3.118	2.935 ± 0.052
4.7516	3.246	3.048 ± 0.045
5.0214	3.345	3.136 ± 0.051
5.3662	3.457	3.233 ± 0.057
5.6331	3.542	3.306 ± 0.053
5.8306	3.611	3.366 ± 0.059
50.173 ± 0.005 °C		
0.1068	0.250	0.245 ± 0.007
0.2325	0.437	0.427 ± 0.004
0.3272	0.594	0.58 ± 0.005
0.4125	0.719	0.702 ± 0.007
0.5324	0.854	0.832 ± 0.008
0.6433	0.955	0.928 ± 0.008
0.7211	1.041	1.012 ± 0.011
0.7882	1.109	1.077 ± 0.019
0.8527	1.159	1.124 ± 0.022
0.8936	1.203	1.166 ± 0.031
0.9385	1.232	1.194 ± 0.052

**Table S4.** Methane adsorption data for the 30 Å pore size silica.

$p$ /bar	$n^{\text{abs}}$ /mmol g <sup>-1</sup>	$n^{\text{exc}}$ /mmol g <sup>-1</sup>
$T = -0.044 \pm 0.005 \text{ } ^\circ\text{C}$		
18.1273	1.86	$1.71 \pm 0.12$
31.1290	2.91	$2.48 \pm 0.21$
40.3358	3.62	$2.98 \pm 0.29$
46.9120	4.11	$3.34 \pm 0.34$
$T = 0.08 \pm 0.01 \text{ } ^\circ\text{C}$		
8.1423	0.965	$0.768 \pm 0.054$
14.2731	1.54	$1.18 \pm 0.10$
18.7675	1.92	$1.46 \pm 0.13$
22.0633	2.19	$1.64 \pm 0.15$
24.4820	2.39	$1.77 \pm 0.17$
26.2558	2.53	$1.87 \pm 0.18$
$T = 25.004 \pm 0.008 \text{ } ^\circ\text{C}$		
20.3106	1.60	$1.14 \pm 0.13$
34.9347	2.56	$1.75 \pm 0.22$
45.4192	3.21	$2.14 \pm 0.29$
53.0032	3.67	$2.41 \pm 0.35$
58.5037	4.01	$2.6 \pm 0.38$
62.5347	4.25	$2.73 \pm 0.41$
$T = 25.016 \pm 0.008 \text{ } ^\circ\text{C}$		
8.0656	0.707	$0.529 \pm 0.049$
14.0623	1.162	$0.848 \pm 0.086$
18.4782	1.48	$1.06 \pm 0.11$
21.7360	1.70	$1.21 \pm 0.13$
$T = 50.093 \pm 0.005 \text{ } ^\circ\text{C}$		
14.2480	0.943	$0.652 \pm 0.08$
24.6950	1.55	$1.03 \pm 0.14$
32.4557	1.91	$1.23 \pm 0.19$
40.6126	2.35	$1.49 \pm 0.23$
46.5815	2.67	$1.67 \pm 0.27$
57.0624	3.21	$1.98 \pm 0.34$
$T = 50.10 \pm 0.02 \text{ } ^\circ\text{C}$		
6.8654	0.465	$0.325 \pm 0.038$
11.9486	0.775	$0.531 \pm 0.067$
15.6840	1.009	$0.687 \pm 0.088$

**Table S5.** Carbon dioxide adsorption data for the 30 Å pore size silica

$p$ /bar	$n^{\text{abs}}$ /mmol g <sup>-1</sup>	$n^{\text{exc}}$ /mmol g <sup>-1</sup>
$T = 0.04 \pm 0.03$ °C		
2.4324	1.780	1.721 ± 0.017
5.1936	2.651	2.523 ± 0.036
7.4110	3.211	3.026 ± 0.051
9.1468	3.575	3.342 ± 0.064
11.8971	4.156	3.847 ± 0.085
$T = 0.00 \pm 0.01$ °C		
1.0814	1.132	1.106 ± 0.008
2.4150	1.766	1.707 ± 0.017
3.5783	2.028	1.941 ± 0.025
4.5216	2.312	2.201 ± 0.032
$T = 25.091 \pm 0.005$ °C		
9.6686	2.552	2.33 ± 0.061
17.7088	3.69	3.26 ± 0.12
26.2619	4.74	4.08 ± 0.18
32.0176	5.48	4.62 ± 0.23
37.1108	6.13	5.10 ± 0.28
$T = 25.12 \pm 0.02$ °C		
2.6221	1.169	1.111 ± 0.017
5.1777	1.782	1.666 ± 0.032
7.2219	2.186	2.023 ± 0.045
8.7936	2.458	2.257 ± 0.055
14.7918	3.36	3.01 ± 0.10
$T = 50.165 \pm 0.008$ °C		
20.1365	2.88	2.44 ± 0.12
35.2439	4.35	3.52 ± 0.23
44.8220	4.91	3.8 ± 0.31
51.1695	5.32	3.99 ± 0.37
55.7434	5.58	4.09 ± 0.43
$T = 50.148 \pm 0.008$ °C		
5.1188	1.123	1.018 ± 0.029
9.4054	1.727	1.531 ± 0.054
12.6966	2.101	1.833 ± 0.073
15.1424	2.360	2.036 ± 0.089
16.9325	2.55	2.18 ± 0.10
18.2463	2.69	2.29 ± 0.11

**Table S6.** Hydrogen sulfide adsorption data for the 30 Å pore size silica

$p$ /bar	$n^{\text{abs}}$ /mmol g <sup>-1</sup>	$n^{\text{exc}}$ /mmol g <sup>-1</sup>
$T = 0.014 \pm 0.005$ °C		
0.0967	0.629	0.627 ± 0.004
0.2935	1.091	1.084 ± 0.009
0.5205	1.435	1.423 ± 0.01
0.7566	1.686	1.668 ± 0.015
0.9625	1.880	1.856 ± 0.021
1.4077	2.228	2.194 ± 0.026
1.7904	2.488	2.445 ± 0.031
2.1817	2.731	2.678 ± 0.037
2.5729	2.972	2.909 ± 0.043
2.9236	3.175	3.103 ± 0.051
3.1920	3.338	3.259 ± 0.06
3.4024	3.467	3.383 ± 0.068
3.6569	3.618	3.528 ± 0.071
3.8473	3.742	3.647 ± 0.074
4.0048	3.835	3.736 ± 0.096
$T = 0.017 \pm 0.005$ °C		
0.1226	0.665	0.662 ± 0.004
0.3329	1.161	1.153 ± 0.006
0.5992	1.517	1.502 ± 0.011
0.8616	1.778	1.758 ± 0.013
1.0791	1.985	1.959 ± 0.020
$T = 25.001 \pm 0.005$ °C		
0.7912	1.021	1.004 ± 0.011
1.8055	1.651	1.611 ± 0.023
2.7602	2.064	2.002 ± 0.034
3.5521	2.354	2.275 ± 0.044
4.1705	2.576	2.482 ± 0.052
4.6707	2.733	2.627 ± 0.059
5.0387	2.862	2.748 ± 0.068
6.1433	3.191	3.05 ± 0.082
6.9732	3.446	3.285 ± 0.090
7.5959	3.65	3.47 ± 0.10
8.0795	3.80	3.61 ± 0.11
$T = 25.064 \pm 0.005$ °C		
0.1651	0.399	0.396 ± 0.005
0.3895	0.684	0.676 ± 0.008
0.6092	0.896	0.882 ± 0.011

**Table S6.** Continued.

$p$ /bar	$\eta^{\text{abs}}$ /mmol g <sup>-1</sup>	$\eta^{\text{exc}}$ /mmol g <sup>-1</sup>
	$T = 25.064 \pm 0.005 \text{ }^\circ\text{C}$	
0.8083	1.055	$1.037 \pm 0.013$
0.9863	1.172	$1.151 \pm 0.016$
1.1274	1.265	$1.241 \pm 0.017$
	$T = 50.161 \pm 0.005 \text{ }^\circ\text{C}$	
1.2073	0.796	$0.772 \pm 0.014$
2.4928	1.265	$1.214 \pm 0.028$
3.6014	1.572	$1.498 \pm 0.041$
4.4863	1.788	$1.696 \pm 0.052$
5.1529	1.956	$1.85 \pm 0.061$
5.6658	2.081	$1.963 \pm 0.068$
	$T = 50.152 \pm 0.005 \text{ }^\circ\text{C}$	
0.7199	0.581	$0.566 \pm 0.010$
2.0197	1.124	$1.083 \pm 0.023$