

**SUPPLEMENTARY TABLE 1.** Main parameters obtained from the application of the DIS method (BET-Hill model) to Argon adsorption isotherms at 77 K on initial kaolinite and by-products. SSA are given in m<sup>2</sup>/g of clays (correction thanks to XRD and Mössbauer data)

Sample	maximum position Ln(P/P <sub>0</sub> )	lateral interactions w/kT	adsorbed volume Wm (cm <sup>3</sup> /g)	local SSA (m <sup>2</sup> /g)	Total SSA (m <sup>2</sup> /g)
1 m	-11.65	-0.20	0.07	0.3	19.3
	-9.80	0.00	0.05	0.2	
	-7.78	0.00	0.22	0.8	
	-5.75	0.70	0.52	1.9	
	-4.37	1.60	1.77	6.5	
	-3.70	1.60	0.93	3.4	
	-2.37	0.00	1.65	6.1	
1 m-Fe	-12.80	0.00	0.06	0.2	17.2
	-9.75	-0.90	0.10	0.4	
	-7.80	-0.30	0.39	1.5	
	-5.74	1.10	0.70	2.6	
	-4.58	1.40	1.26	4.7	
	-3.61	1.40	0.44	1.6	
	-2.41	0.00	1.36	5.0	
	-12.38	1.00	0.03	0.1	
	-9.82	-1.10	0.15	0.6	
	-7.70	0.20	0.27	1.0	
3 m-Fe	-5.64	1.00	0.94	3.5	16.0
	-4.49	1.60	1.03	3.8	
	-3.62	1.60	0.33	1.2	
	-2.41	0.00	1.39	5.2	
	-12.52	-0.20	0.05	0.2	
	-9.78	-1.10	0.18	0.7	
	-7.44	0.00	0.35	1.3	
9 m-Fe	-5.47	0.90	0.88	3.3	17.2
	-4.41	1.60	1.18	4.4	
	-3.61	1.60	0.32	1.2	
	-2.41	0.00	1.50	5.6	
	-12.37	-0.20	0.06	0.2	
	-9.28	0.00	0.20	0.8	
	-7.46	0.90	0.27	1.0	
1 m-Fe-O <sub>2</sub>	-5.65	1.10	1.26	4.7	18.4
	-4.44	1.60	1.19	4.4	
	-3.60	1.60	0.28	1.0	
	-2.43	0.00	1.33	4.9	
	-13.02	0.9	0.14	0.5	
	-9.79	-0.3	0.48	1.8	
	-7.44	0.3	0.64	2.4	
3 m-Fe-O <sub>2</sub>	-5.75	0.8	0.89	3.3	33.8
	-4.36	1.6	2.55	9.5	
	-3.62	1.6	0.57	2.1	
	-2.42	0.00	2.96	11.0	
	-13.50	0.70	0.27	1.0	
	-10.53	-0.70	1.22	4.5	
	-7.46	0.00	1.96	7.3	
9 m-Fe-O <sub>2</sub>	-5.52	0.80	1.60	5.9	58.5
	-4.44	1.60	2.50	9.3	
	-3.64	1.60	1.84	6.8	
	-2.41	0.00	4.63	17.2	