

Supplementary Materials:

Table S1. Characteristics of the adsorbents where α is the measured content, P is the reagent purity, D_{p50} is the median particle size, and S_{BET} is the Brunauer–Emmett–Teller (BET) surface area.

No.	Adsorbent	α_{Mg} (%)	α_{Ca} (%)	P (%)	D_{p50} (μm)	S_{BET} (m^2/g)
(1) ¹	MgO	59.1	-	98.0	1.54	4.3
(2) ¹	Mg(OH) ₂	40.6	-	97.3	4.13	22.0
(3) ¹	MgCO ₃	24.8	-	86.1	15.0	26.0
(4) ¹	CaO	-	71.2	99.6	19.6	2.7
(5) ¹	Ca(OH) ₂	-	53.5	98.9	41.7	14.3
(6) ²	CaCO ₃	-	39.7	99.1	15.4	0.8

¹ Data from Sugita et al. (2016) [38]. ² Data from this study.

Table S2. Target and measured values for the $C_{AS0} = 1$ mg/L, single-addition tests where one type of adsorbent was employed at a time to assess As removal.

No.	Adsorbent	Target value		Measured value						
		W_{Ad}/V [g/L]	C_{AS0} [mg/L]	W_{Ad}/V [g/L]	pH_0 [-]	pH_f [-]	C_{AS0} [mg/L]	C_{AS} [mg/L]	C_{Mg} [mg/L]	C_{Ca} [mg/L]
1	MgO	0.2	1	0.207	7.18	10.94	0.998	0.558	11.2	-
2	Mg(OH) ₂	0.2	1	0.206	7.14	10.44	1.00	0.132	4.20	-
3	MgCO ₃	0.2	1	0.210	7.03	10.66	0.989	0.653	22.5	-
4	CaO	0.2	1	0.215	6.97	11.80	0.995	0.951	-	129
5	Ca(OH) ₂	0.2	1	0.207	6.97	11.72	0.995	0.894	-	103
6	CaCO ₃	0.2	1	0.218	7.03	9.70	0.989	0.972	-	4.69
7	MgO	0.4	1	0.402	6.91	10.81	1.00	0.019	8.12	-
8	Mg(OH) ₂	0.4	1	0.398	6.91	10.48	1.00	0.025	4.66	-
9	MgCO ₃	0.4	1	0.407	7.26	10.68	1.00	0.465	25.0	-
10	CaO	0.4	1	0.404	6.91	12.05	1.00	0.844	-	214
11	Ca(OH) ₂	0.4	1	0.402	6.91	12.04	1.00	0.801	-	206
12	CaCO ₃	0.4	1	0.402	7.26	9.71	1.00	0.981	-	5.04

* The data for test nos.1–6 are mean values ($n = 3$).

Table S3. Relative standard errors for test nos. 1–6 in Table S1.

No.	Target value			ε [%]				
	Adsorbent	W_{Ad}/V [g/L]	C_{AS0} [mg/L]	W_{Ad}/V	pH_f	C_{AS}	C_{Mg}	C_{Ca}
1	MgO	0.2	1	0.9	0.0	4.7	3.9	-
2	Mg(OH) ₂	0.2	1	0.5	0.1	3.9	0.2	-
3	MgCO ₃	0.2	1	0.5	0.1	4.3	4.0	-
4	CaO	0.2	1	1.2	0.1	0.5	-	2.8
5	Ca(OH) ₂	0.2	1	0.3	0.1	1.2	-	0.4
6	CaCO ₃	0.2	1	0.5	0.0	0.5	-	0.3

Table S4. Target and measured values for the $C_{AS0} = 10$ mg/L, single-addition tests where one type of adsorbent was employed at a time to assess As removal.

No.	Target value			Measured value						
	Adsorbent	W_{Ad}/V [g/L]	C_{AS0} [mg/L]	W_{Ad}/V [g/L]	pH_0 [-]	pH_f [-]	C_{AS0} [mg/L]	C_{AS} [mg/L]	C_{Mg} [mg/L]	C_{Ca} [mg/L]
13	MgO	0.2	10	0.204	7.13	10.89	10.1	8.37	10.4	-
14	Mg(OH) ₂	0.2	10	0.207	7.23	10.39	10.0	8.70	4.42	-
15	MgCO ₃	0.2	10	0.210	7.12	10.59	10.0	9.14	20.9	-
16	CaO	0.2	10	0.204	7.32	11.81	9.92	7.59	-	118
17	Ca(OH) ₂	0.2	10	0.205	7.32	11.73	9.92	9.44	-	99.6
18	CaCO ₃	0.2	10	0.212	7.12	9.45	10.0	10.0	-	5.39
19	MgO	0.4	10	0.415	7.32	10.92	9.92	6.81	10.3	-
20	Mg(OH) ₂	0.4	10	0.409	7.26	10.41	10.0	7.39	4.55	-
21	MgCO ₃	0.4	10	0.406	7.32	10.60	9.92	8.06	21.9	-
22	CaO	0.4	10	0.404	7.15	12.03	10.2	4.93	-	195
23	Ca(OH) ₂	0.4	10	0.414	7.15	12.05	10.2	4.02	-	201
24	CaCO ₃	0.4	10	0.412	7.32	9.61	9.92	9.92	-	5.54

Table S5. Target and measured values for the $C_{AS0} = 1$ mg/L, combined-addition tests where two types of adsorbents were added at a time to assess As removal.

	Target value			Measured value						
No.	Adsorbent	W_{Ad}/V [g/L]	C_{AS0} [mg/L]	W_{Ad}/V [g/L]	pH_0 [-]	pH_t [-]	C_{AS0} [mg/L]	C_{AS} [mg/L]	C_{Mg} [mg/L]	C_{Ca} [mg/L]
25	MgO	0.2	1	0.216	6.91	10.84	1.00	0.001	8.57	-
	Mg(OH) ₂	0.2		0.208						
26	MgO	0.2	1	0.214	7.03	10.82	0.989	0.011	23.5	-
	MgCO ₃	0.2		0.216						
27	Mg(OH) ₂	0.2	1	0.200	7.03	10.51	0.989	0.115	23.2	-
	MgCO ₃	0.2		0.212						
28	CaO	0.2	1	0.204	6.91	12.05	1.00	0.674	-	218
	Ca(OH) ₂	0.2		0.216						
29	CaO	0.2	1	0.208	7.03	11.82	0.989	0.973	-	146
	CaCO ₃	0.2		0.210						
30	Ca(OH) ₂	0.2	1	0.200	7.03	11.66	0.989	0.854	-	101
	CaCO ₃	0.2		0.214						
31	MgO	0.2	1	0.202	6.91	11.76	1.00	0.145	0.59	105
	CaO	0.2		0.208						
32	MgO	0.2	1	0.212	6.91	11.77	1.00	0.425	0.39	107
	Ca(OH) ₂	0.2		0.222						
33	MgO	0.2	1	0.216	7.03	10.94	0.989	0.343	11.8	2.88
	CaCO ₃	0.2		0.214						
34	Mg(OH) ₂	0.2	1	0.214	6.91	11.77	1.00	0.009	0.03	105
	CaO	0.2		0.208						
35	Mg(OH) ₂	0.2	1	0.210	6.91	11.76	1.00	0.100	0.03	102
	Ca(OH) ₂	0.2		0.212						
36	Mg(OH) ₂	0.2	1	0.206	7.03	10.41	0.989	0.206	4.15	2.58
	CaCO ₃	0.2		0.214						
37	MgCO ₃	0.2	1	0.218	7.03	11.50	0.989	0.003	0.16	66.3
	CaO	0.2		0.202						
38	MgCO ₃	0.2	1	0.204	7.03	11.16	0.989	0.001	0.69	31.2
	Ca(OH) ₂	0.2		0.212						
39	MgCO ₃	0.2	1	0.216	7.03	10.63	0.989	0.660	22.3	1.14
	CaCO ₃	0.2		0.210						

Table S6. Target and measured values for the $C_{AS0} = 10$ mg/L, combined-addition tests where two types of adsorbents were added at a time to assess As removal.

	Target value			Measured value						
No.	Adsorbent	W_{Ad}/V [g/L]	C_{AS0} [mg/L]	W_{Ad}/V [g/L]	pH_0 [-]	pH_t [-]	C_{AS0} [mg/L]	C_{AS} [mg/L]	C_{Mg} [mg/L]	C_{Ca} [mg/L]
40	MgO Mg(OH) ₂	0.2 0.2	10	0.206 0.208	7.15	10.90	10.2	5.74	10.9	-
41	MgO MgCO ₃	0.2 0.2	10	0.210 0.210	7.12	10.76	10.0	6.65	18.6	-
42	Mg(OH) ₂ MgCO ₃	0.2 0.2	10	0.200 0.204	7.12	10.57	10.0	7.91	19.5	-
43	CaO Ca(OH) ₂	0.2 0.2	10	0.206 0.208	7.15	12.02	10.2	4.08	-	193
44	CaO CaCO ₃	0.2 0.2	10	0.206 0.212	7.12	11.80	10.0	5.76	-	128
45	Ca(OH) ₂ CaCO ₃	0.2 0.2	10	0.208 0.204	7.12	11.68	10.0	9.20	-	102
46	MgO CaO	0.2 0.2	10	0.210 0.204	7.15	11.73	10.2	8.58	0.69	99.8
47	MgO Ca(OH) ₂	0.2 0.2	10	0.206 0.204	7.15	11.73	10.2	8.87	0.61	96.7
48	MgO CaCO ₃	0.2 0.2	10	0.208 0.200	7.12	10.89	10.0	8.97	10.1	2.87
49	Mg(OH) ₂ CaO	0.2 0.2	10	0.208 0.210	7.15	11.73	10.2	6.33	0.02	96.3
50	Mg(OH) ₂ Ca(OH) ₂	0.2 0.2	10	0.210 0.206	7.15	11.73	10.2	4.27	0.03	94.9
51	Mg(OH) ₂ CaCO ₃	0.2 0.2	10	0.208 0.200	7.12	10.41	10.0	8.79	4.09	2.43
52	MgCO ₃ CaO	0.2 0.2	10	0.206 0.205	7.26	11.60	9.95	3.59	1.33	84.4
53	MgCO ₃ Ca(OH) ₂	0.2 0.2	10	0.210 0.207	7.26	11.39	9.95	1.62	2.47	49.6
54	MgCO ₃ CaCO ₃	0.2 0.2	10	0.214 0.214	7.12	10.54	10.0	9.04	18.8	1.14