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SUPPLEMENTARY MATERIAL TO

A new method of processing CO_2 and magnesite slag simultaneously

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Table S-I. Different MgO-based adsorbents performance

Adsorbent	$T_{calcination}$ °C	$t_{calcination}$ h	$T_{regeneration}$ °C	$T_{adsorption}$ °C	Adsorption capacity, mmol/g
MgO/Al_2O_3[1]	600	5	120	25	0.73
MgO (solvothermal)[2]	450	6.7	-	-	-
MgO/OMC[3]	900	6	200	25	2.04
MgO/ CMK-3[4]	800	8.8	800	25	1.81
MgO(solvothermal)[5]	550	22	160-840	90	0.36
Foam magnesia[6]	600	12	30-600	100	2.61
MgO/Al-SBA[7]	450	7.8	100	25	1.36
MgO[8]	400	8.6	-	50	0.81
MgO/k-SBA[9]	540	17	300	20	0.91
MgO[10]	400	5.3	-	50	1.59
MG-480-42-13.8[11]	480	0.7	-	60	0.77
MgO/BM2.5h[12]	323	0.5	850	25	1.61
MgO/Al_2O_3-0.2[13]	400	1	450	60	2.1
Calcinated magnestie[14]	550	4	550	60	1.82
Calcinated magnesite slag (This work)	500	5	550	80	3.01

Table S-II. The conditions and results comparison of calcined magnesite slag with magnesite

Sample	$T_{calcination}$ °C	$t_{calcination}$ h	$T_{regeneration}$ °C	Flow rate mL/min	$p_{adsorption}$ MPa	CO_2 adsorption capacity, mmol/g
Magnesite[14]	550	4	60	100	0.4	1.82
Magnesite slag	500	5	80	150	0.4	2.12
	500	5	80	150	0.8	3.01

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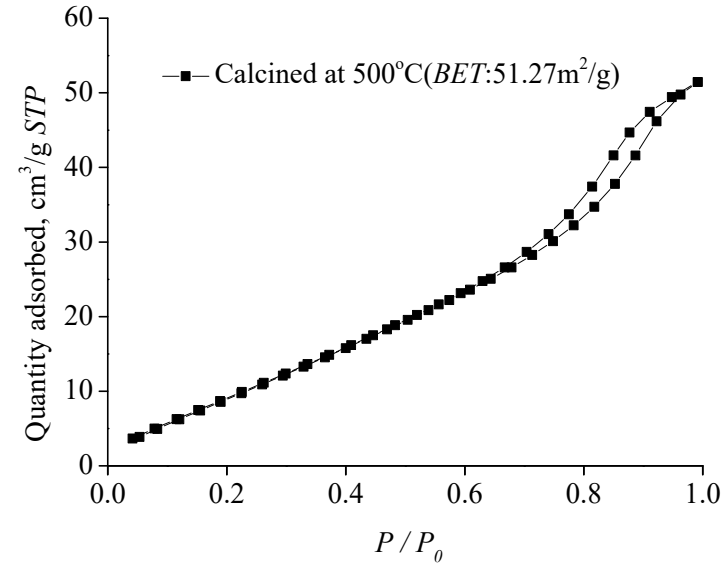
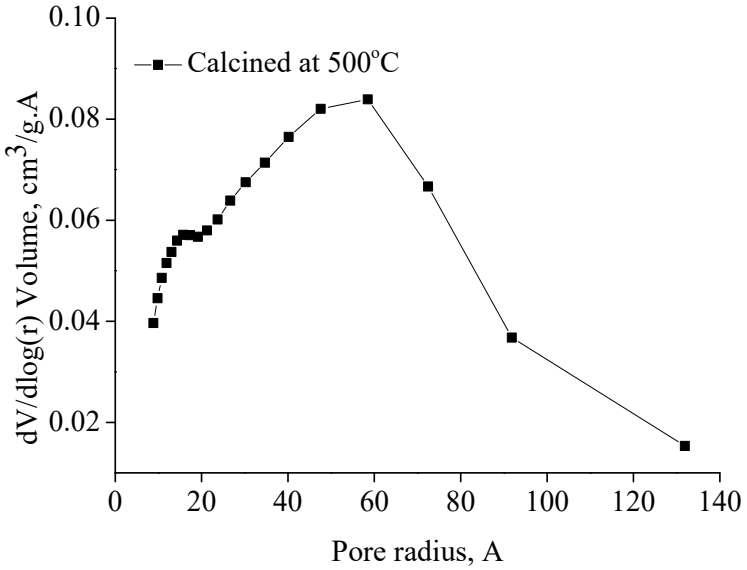
Table S-III. The XRF results (%) of calcined magnesite slag and magnesite

Sample	Mg	Si	Mn	Ca	Fe	Al
Magnesite slag	32.18	11.09	3.18	1.51	1.19	3.82
Magnesite	53.59	0.22	5.87	0.8	0.79	–

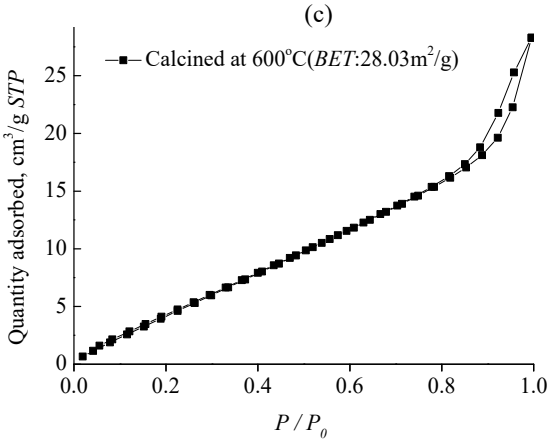
(a)



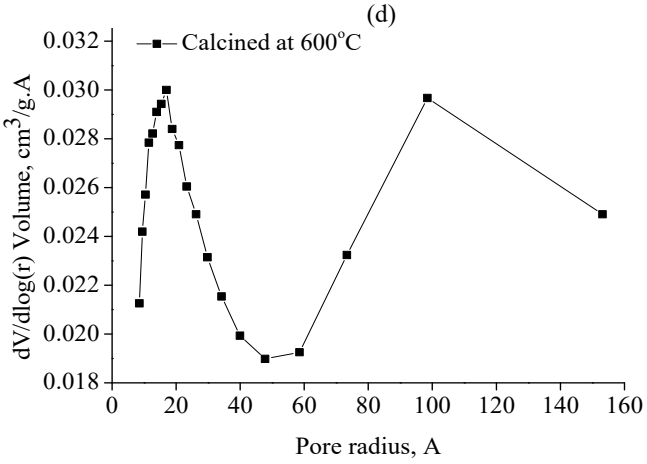
(b)



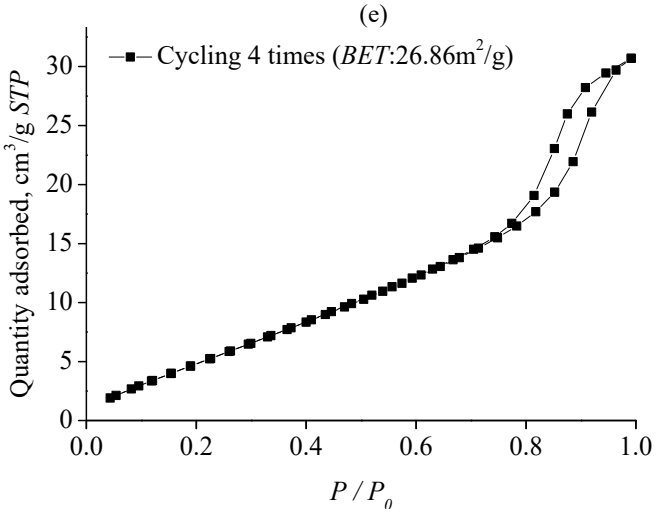
(c)



(d)



(e)



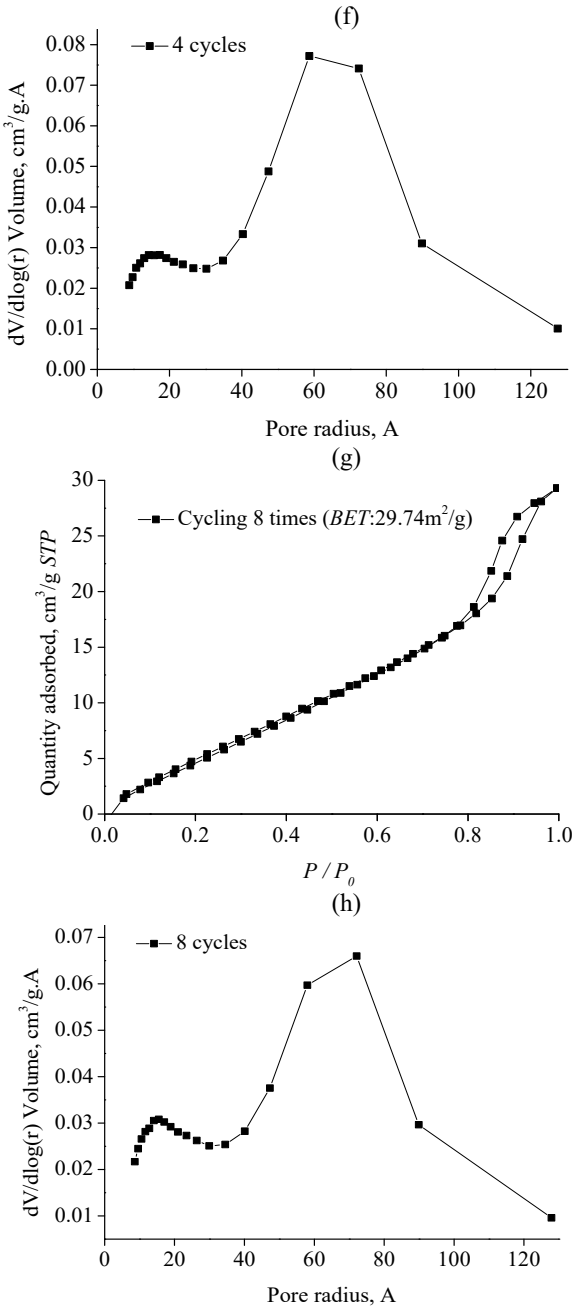


Fig. S-1. N_2 adsorption–desorption isotherms (a, c, e and g) and pore size distributions (b, d, f and h) of magnesite slag calcined at 500 °C for 5 h, 600 °C for 5 h, after 4 cycles and after 8 cycles (P/P_0: relative pressure; *STP*: standard temperature and pressure).

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