

Supplementary material

Article

Microwave assisted the Boudouard reaction: Highly effective reduction of the greenhouse gas CO₂ to useful CO feedstock with Semi-Coke

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--**Figure S1** Schematic diagram of microwave experiment device

--**Table S1** Experiment Data

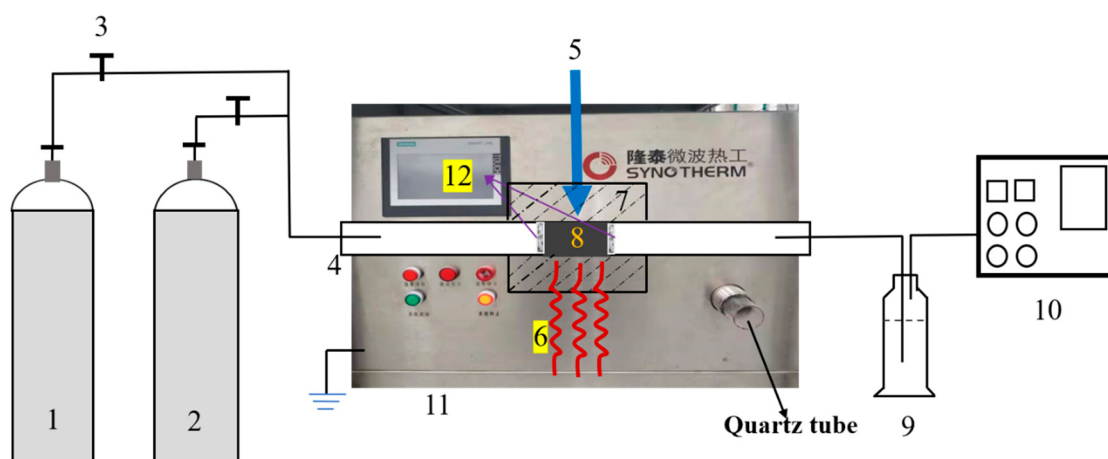


Figure S1 Schematic diagram of microwave experiment device (1. CO₂ gas; 2. Ar gas; 3. Mass flow controller; 4. Quartz tube; 5. Infrared thermometer; 6. Microwave source; 7. Insulation materials; 8. Sample; 9. Filter bottle; 10. Micro GC; 11. Microwave furnace; 12. High temperature quartz fiber).

Table S1 Experiment Data

Thermal field	Temperature/ °C	Sample Le/g	CO ₂ flow /ml/min	Particle size/mm	Catalytic/ 5wt.%	X _{SC} / %	CO output /mmol
Conventional heating	800	5	20	0.200-0.450	-	0.6	8.1
	850	5	20	0.200-0.450	-	1.6	15.2
	900	5	20	0.200-0.450	-	4.0	30.4
	950	5	20	0.200-0.450	-	7.4	59.1
Microwave heating	750	40	175	0.200-0.450	-	18.0	1163
	800	40	175	0.200-0.450	-	25.8	1562
	850	40	175	0.200-0.450	-	29.0	1849
	900	40	175	0.200-0.450	-	34.8	2000
	800	40	125	>0.200	-	23.1	1329
	800	40	125	0.200-0.450	-	23.7	1426
	800	40	125	0.450-0.850	-	18.7	1191
	800	40	125	0.850-1.400	-	16.2	1082
	800	40	150	0.200-0.450	-	24.9	1558
	800	40	200	0.200-0.450	-	26.5	1581
	750	40	200	0.200-0.450	-	25.6	1689
	750	40	200	0.200-0.450	CaO	68.2	2392
Microwave heating	750	40	200	0.200-0.450	BaCO ₃	66.6	2520