

Supporting Information for
Autothermal CaO Looping Biomass Gasification for Renewable Syngas
Production

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Figure S4. Influence of the biomass feed temperature on the key product flow rates.

Table S1 Influence of the biomass feed temperature on product flow rates.

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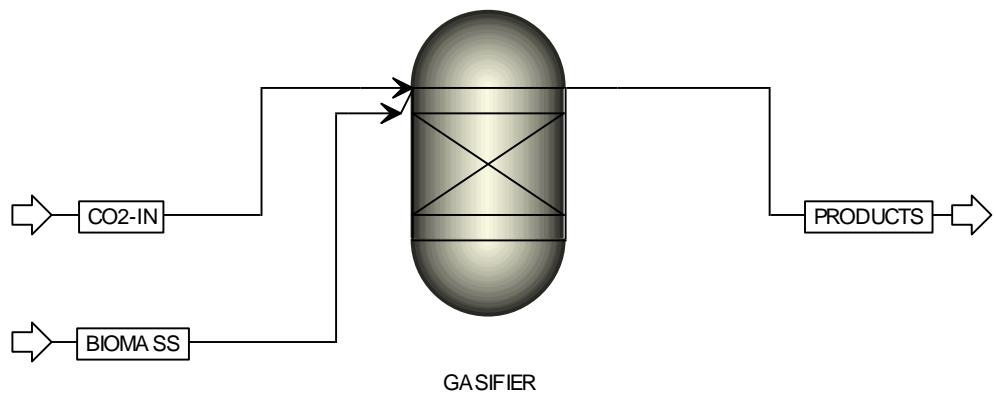


Figure S1. Process flow diagram of traditional biomass gasification using 1kg/h CO₂; 0.1-0.5 kg/h biomass (guaiacol); Gibbs reactor.

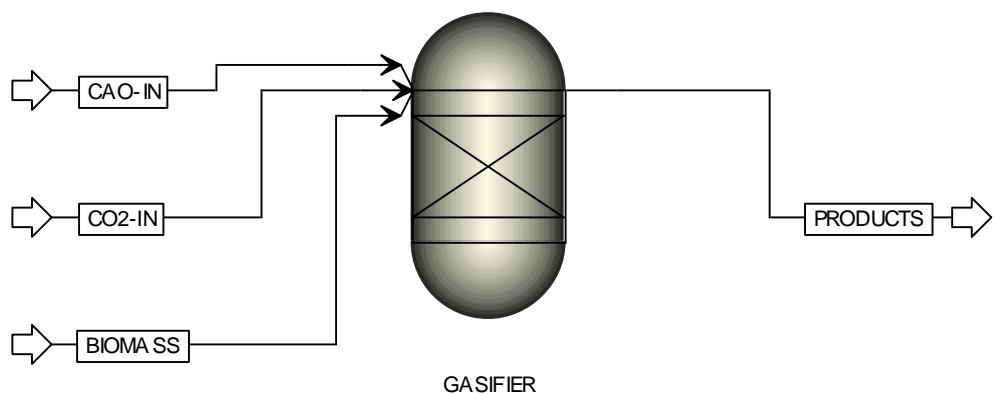


Figure S2. Process flow diagram of novel Auto-CaL-Gas technology using 1 kg/h CaO; 1kg/h CO₂; 0.1-0.5 kg/h biomass (guaiacol); Gibbs reactor.

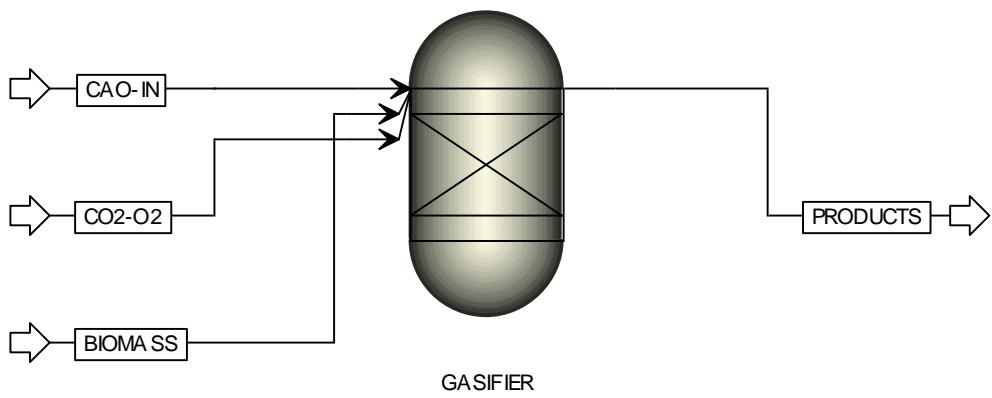


Figure S3. Process flow diagram of novel Auto-CaL-Gas technology with oxygen introduction using 1kg/h CaO; 1kg/h CO₂; 0.1-0.5 kg/h biomass (guaiacol); 0.025-0.1kg/h O₂; Gibbs reactor.

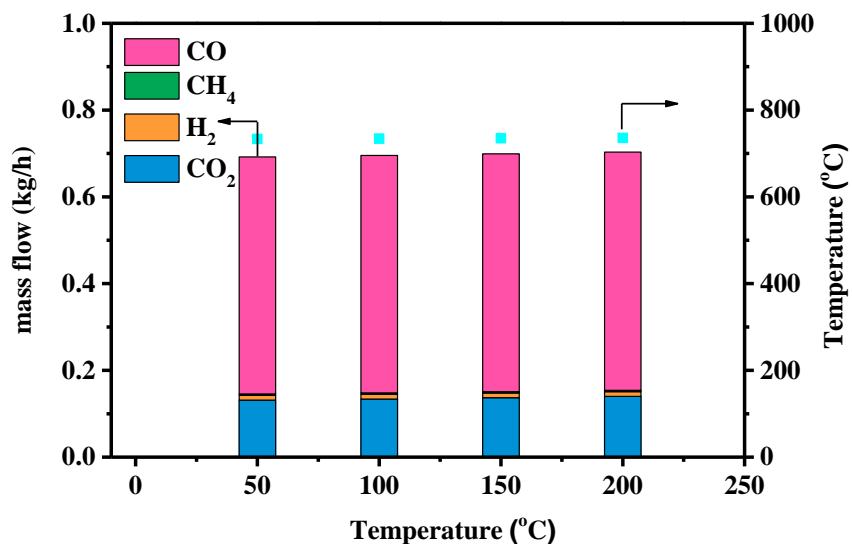


Figure S4. Influence of the biomass feed temperature on the key product flow rates.

Table S1 Influence of the biomass feed temperature on product flow rates^a

Temperature (°C)	Total outlet mass Flows (kg/h)	CaO (kg/h)	CO ₂ (kg/h)	Guaiacol (kg/h)	CaCO ₃ (kg/h)	H ₂ (kg/h)	CH ₄ (kg/h)	CO (kg/h)	H ₂ O (kg/h)	T (°C)	Cold gas efficiency (%)
50	2.2	0.37	0.13	0	1.13	0.01	0	0.55	0.01	733.5	83.8
100	2.2	0.37	0.13	0	1.12	0.01	0	0.55	0.01	734.1	83.8
150	2.2	0.38	0.14	0	1.11	0.01	0	0.55	0.01	735.0	83.8
200	2.2	0.38	0.14	0	1.10	0.01	0	0.55	0.01	736.0	83.8

^aOther experimental conditions: 1 kg/h CaO; 0.2 kg/h biomass (guaiacol); 1 kg/h CO₂; inlet temperature of 650 °C for CaO and CO₂.