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Supplementary material for: 'Parametric sensitivity in the Sabatier reaction over Ru/Al_2O_3 – determination of the minimal requirements for reactor activation'

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The trajectory inside the adiabatic reactor is represented by a straight line in the CO_2 conversion-temperature space.

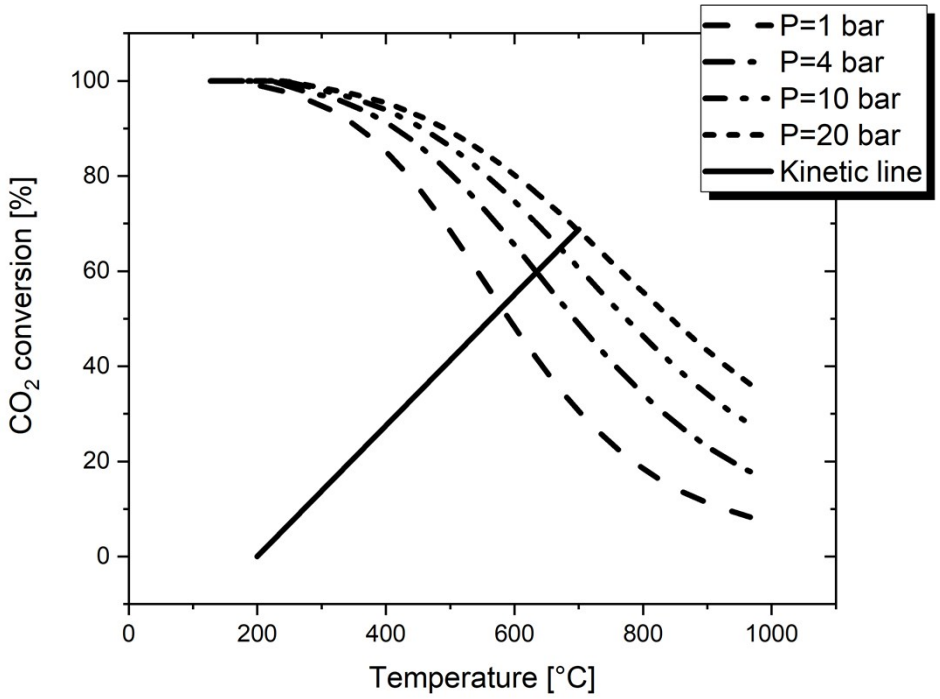

***Fig. S1**. Kinetic line of the adiabatic reactor and thermodynamic equilibrium in the CO_2-temperature space (equilibrium for the single Sabatier reaction)*

The performance of a cooled reactor as a function of the coolant temperature is shown in Fig. S2.

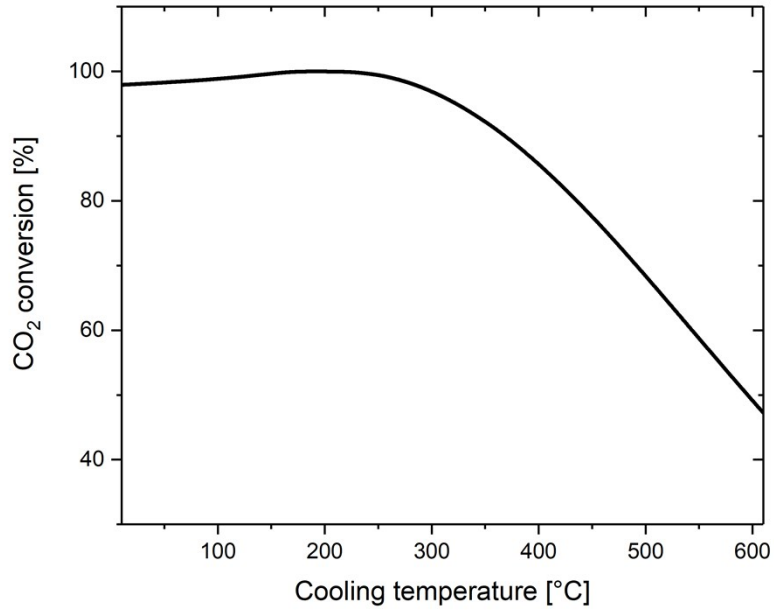

***Fig. S2**. Effect of cooling temperature on CO_2 conversion (T_{in}=250 °C, P=10 bar, GHSV=1500 h^{-1})*

Figure S3 and S4 show the effect of space velocity on the CO_2 conversion varying coolant and inlet temperature. (1500 h^{-1} and 800 h^{-1} respectively)

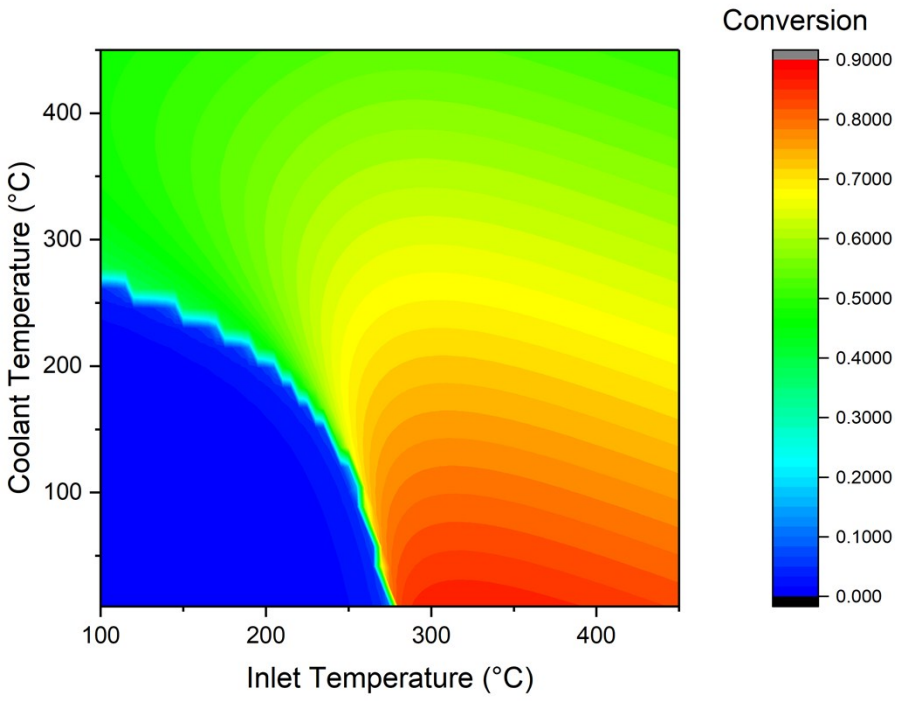

***Fig. S3**. Effect of coolant and inlet temperature on CO_2 conversion (P=10 bar, GHSV=1500 h^{-1}, D=0.01 m)*

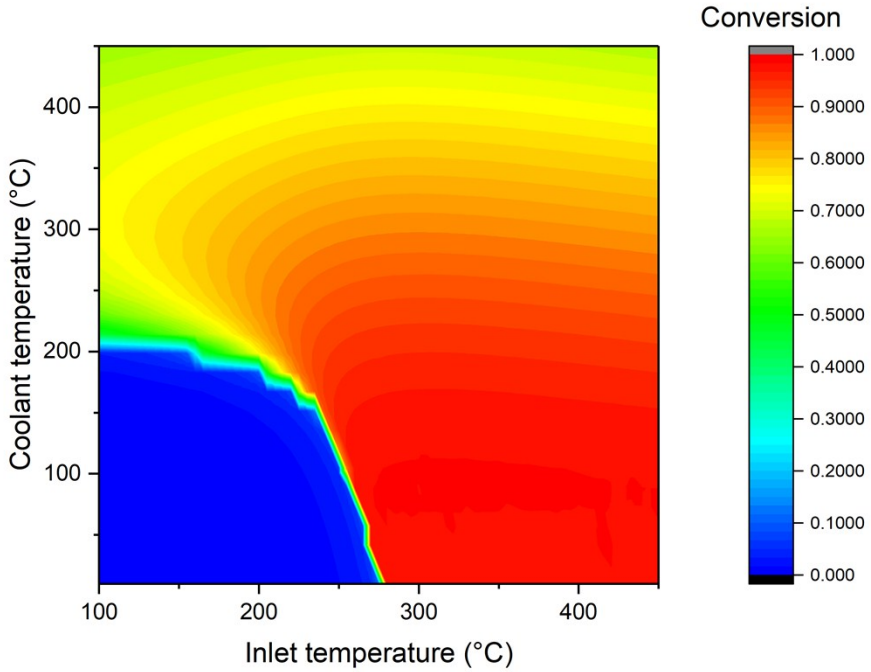

***Fig. S4**. Effect of coolant and inlet temperature on CO_2 conversion (P=10 bar, GHSV=800 h^{-1}, D=0.01 m)*

Fig. S5 shows the influence of the split ratio of the feed stream on the CO_2 conversion and hotspot temperature.

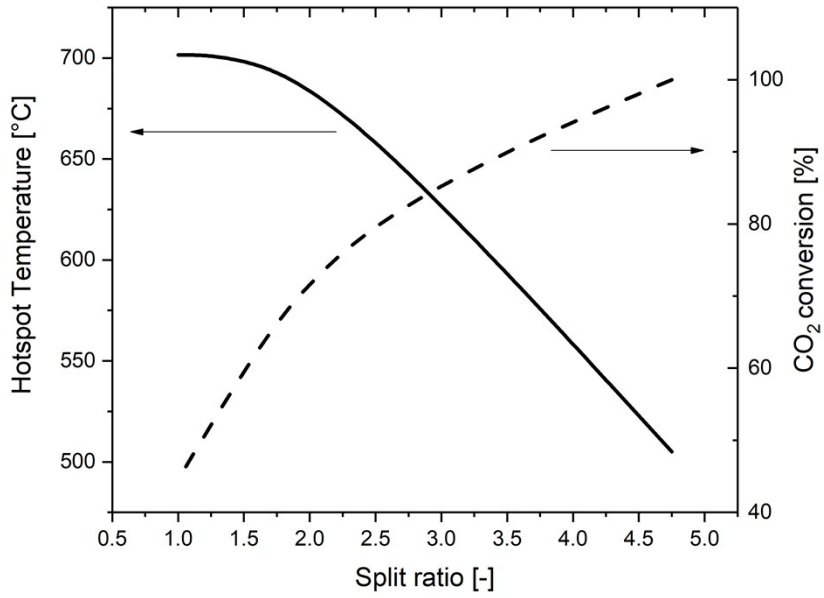

***Fig. S5**. Influence of split ratio on conversion and hotspot temperature in a single adiabatic stage (T_{in}=200 °C, P= 10 bar, GHSV=3000 h^{-1})*