

Supplementary Information

Low-Temperature CO Oxidation over Rh/Al₂O₃ in a Stagnation-Flow Reactor

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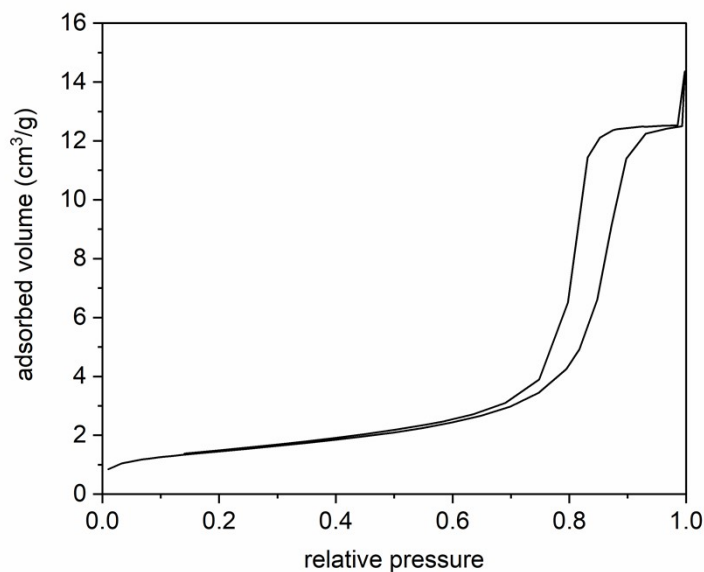


Figure S1. N₂-physisorption isotherm (type IV), with a hysteresis loop due to capillary condensation.

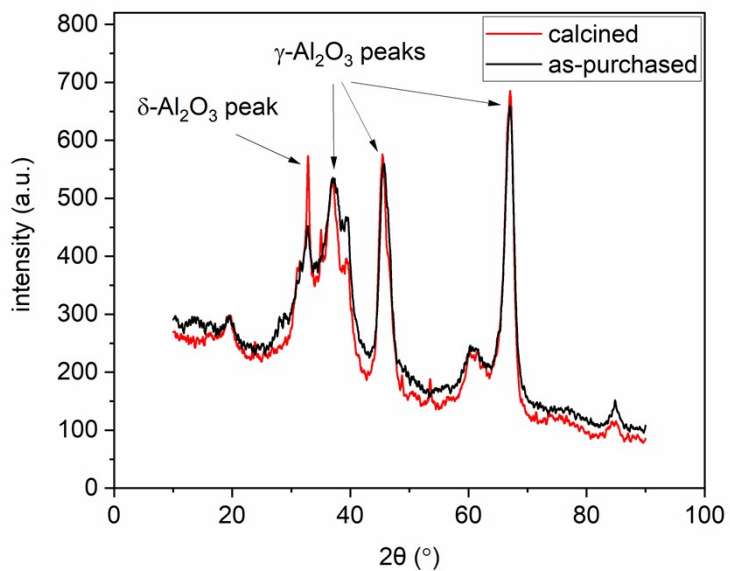


Figure S2. The XRD patterns of the as-purchased catalyst and the catalyst calcined in air at 700 °C for two hours. The patterns look fairly identical, with the exception of a $\delta\text{-Al}_2\text{O}_3$ peak appearing after calcination, due to exposure to high heat.

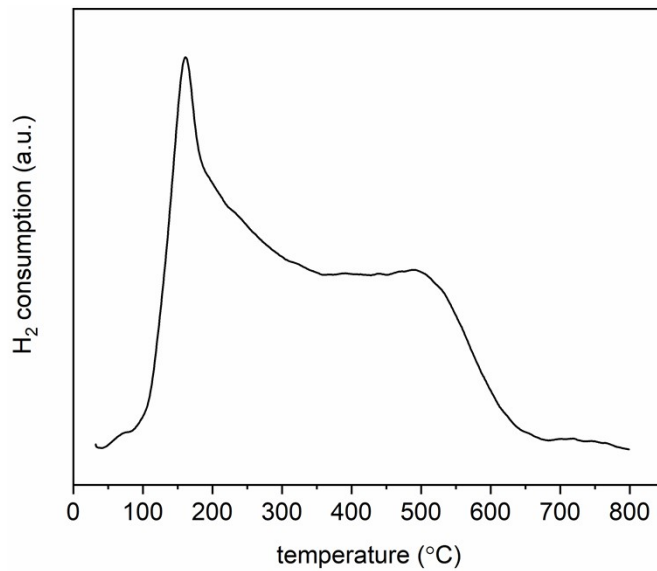


Figure S3. The H_2 -TPR peak of calcined $\text{Rh}/\text{Al}_2\text{O}_3$, with one shoulder near 160 °C and another near 500 °C.

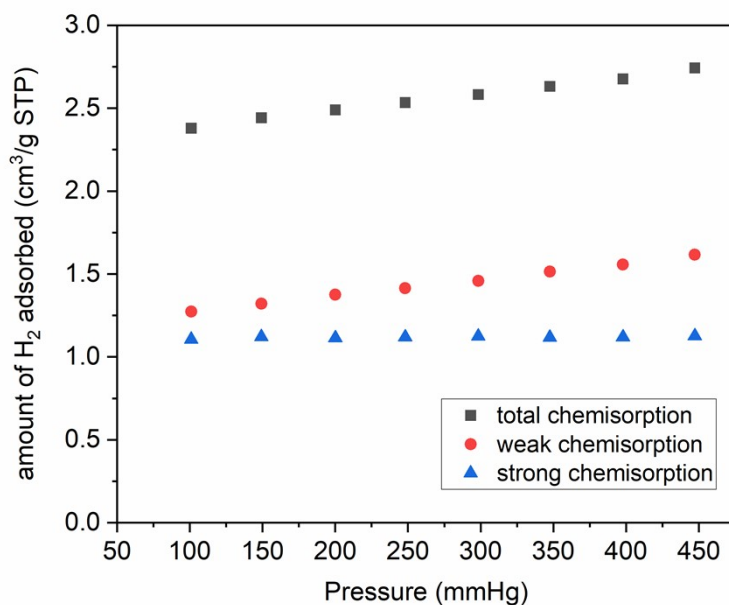


Figure S4. The H₂-chemisorption profiles of the reduced catalyst: total chemisorption refers to the initial H₂ adsorption profile (chemisorbed and physisorbed), weak chemisorption refers to the H₂ that is physically adsorbed, and strong chemisorption is the difference between the two, i.e. chemisorbed.

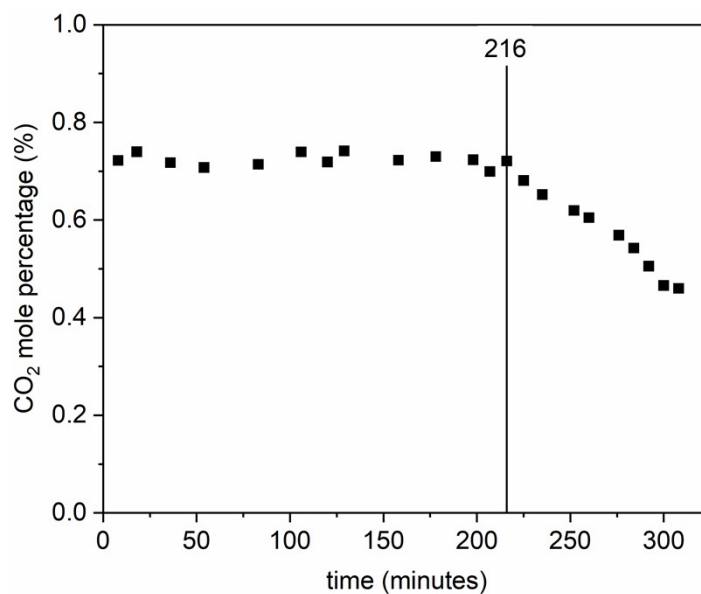


Figure S5. Deactivation: reactivity was consistent for nearly 3.5 hours at which point a decrease was observed. The test was conducted at a flowrate of 24 g/min, stoichiometric inlet composition, 275 °C, and 0.6 bar.

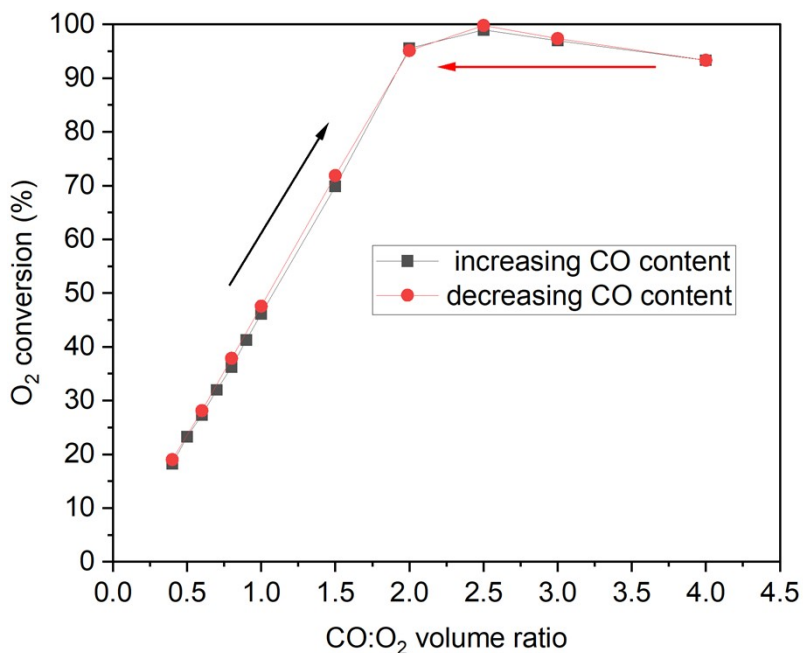


Figure S6. O₂ conversion as a function of CO:O₂ volume ratio to test for hysteresis. No hysteresis behavior was observed upon changing the CO content at the expense of the inert, whereby the CO:O₂ ratio was varied from 0.4 to 4 (shown in black) then back to 0.4 (shown in red) at 300 °C and 24 g/min. This is justified by the fact that the CO content does not change the oxidation state of the surface. Towards high CO content the O₂ conversion starts to decrease because CO is poisoning the surface by occupying more active sites.

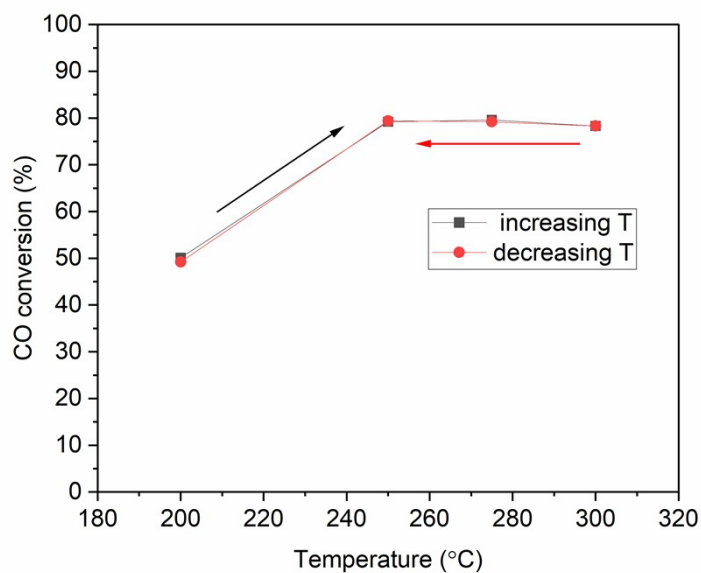


Figure S7. CO conversion as a function of temperature to test for hysteresis. No hysteresis behavior was observed upon changing the temperature from 200 °C to 300 °C (shown in black) then back to 200 °C (shown in red). This signifies that no sintering takes place on the catalyst surface upon short-time exposure to 300 °C.