Supplementary Information

Co$_3$O$_4$ morphology in the preferential oxidation of CO

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Figure S1: In situ XRD scans and degree of reduction from magnetometer measurements for nanosheets/SiO$_2$. A: in situ XRD on top view. B: effluent flow rate of CO, CO$_2$, CH$_4$ and O$_2$. C: degree of reduction measured in the magnetometer. (Temperature: 450 °C, Heating rate: 50 °C to 450 °C back to 50 °C holding for 1 hr every 25 °C with a ramp rate of 1 °C/min, magnetic readings: taken at -20, 0, 20 and 0 kOe every 10 min).
Figure S2: In situ XRD scans and degree of reduction from magnetometer measurements for nanobelts/SiO\textsubscript{2}. A: in situ XRD on top view. B: effluent flow rate of CO, CO\textsubscript{2}, CH\textsubscript{4} and O\textsubscript{2}. C: degree of reduction measured in the magnetometer. (Temperature: 450 °C, Heating rate: 50 °C to 450 °C back to 50 °C holding for 1 hr every 25 °C with a ramp rate of 1 °C/min, magnetic readings: taken at -20, 0, 20 and 0 kOe every 10 min).
Figure S3: TEM micrographs of spent Co₃O₄/SiO₂ model catalysts after exposure to CO-PROX reaction conditions at maximum temperature of 450 °C.
Figure S4: TEM micrographs of Co$_3$O$_4$/SiO$_2$ model catalysts after exposure to CO-PROX reaction conditions up to a temperature of 270°C for the nanocubes and 250°C for the nanosheets and nanobelts. XRD confirms the reduction to CoO.
Figure S5: XRD scans of fresh and spent Co$_3$O$_4$/SiO$_2$ model catalyst (A) nanocubes, (B) nanosheets, (C) nanobelts, (D) N-nanoparticles and reference cobalt diffraction patterns.
Figure S6: XPS profiles of wide spectrum, Co 2p in the $\text{Co}_3\text{O}_4/\text{SiO}_2$ (nanocubes)
Figure S7: XPS profiles of wide spectrum, Co 2p in the Co$_3$O$_4$/SiO$_2$ (nanosheets)
Figure S8: XPS profiles of wide spectrum, Co 2p in the Co$_3$O$_4$/SiO$_2$ (nanobelts)
Figure S9: Cumulative area under the H\textsubscript{2}-TPR for the supported nanoparticles, nanocubes, nanosheets and nanobelts model catalysts