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Supplementary Information for Article: Catalytic hydrogenation of CO₂ to methane over supported Pd, Rh and Ni catalysts

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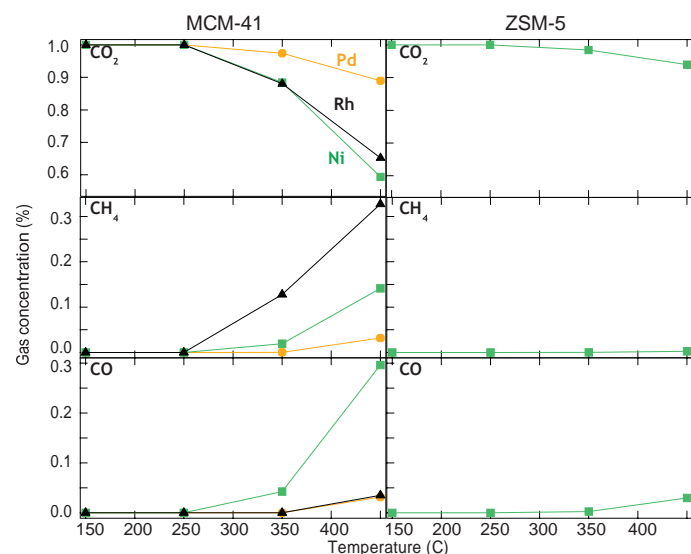


Fig. S1 Steady-state outlet concentration of CO₂ (top), CH₄ (middle) and CO (bottom) as a function of temperature during the reaction between 1 % CO₂ and 5 % H₂ in Ar gas with a total flow rate of 2000 ml/min at atmospheric pressure over the Pd (orange), Ni (green) and Rh (black) catalysts supported on MCM-41 (left panel) and over the Ni/ZSM-5 (right panel) catalyst.

Figure S1 shows the catalytic performance of the metal-promoted MCM-41 and ZSM-5 catalysts for CO₂ hydrogenation. The inlet gas concentrations to the flow reactor are 1% CO₂ and 5% H₂ in Ar and each marker in the figure represents the calculated average value over a 10 min period. The main reaction products formed during CO₂ hydrogenation are CH₄, CO and H₂O. No hy-

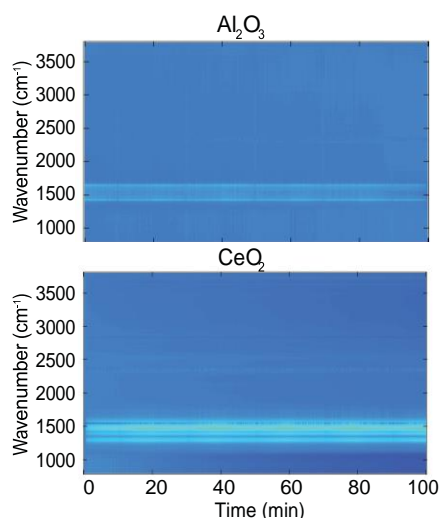


Fig. S2 Transient hydrogenation of 0.2% CO₂ over Al₂O₃ (upp) and CeO₂ (bottom) during periodic variation of the feed gas composition between 0.8% H₂+0.2% CO₂ and 0.2% CO₂ at 350 °C for 10 min. The panels show the color coded intensities (blue corresponds to low intensity, red to high intensity) of the IR bands in the region 790-3800 cm⁻¹ versus time.

drocarbon compounds except methane are observed.

Figure S2 shows the DRIFTS results for the hydrogen pulse experiments under a continuous flow of CO₂ for alumina and ceria at 350 °C.

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