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Electronic Supplementary Information for Article: Structure-function relationship during CO₂ methana- tion over Rh/Al₂O₃ and Rh/SiO₂ catalysts at atmo- spheric pressure conditions

Natalia M. Martin,^{*a} Felix Hemmingsson,^a Xueting Wang,^a Lindsay R. Merte,^b Uta Hejral,^c Johan Gustafson,^c Magnus Skoglundh,^a Debora Motta Meira,^d Ann-Christin Dippel,^e Olof Gutowski,^e Matthias Bauer,^f and Per-Anders Carlsson^a

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Figure S1 shows the live measurements recorded using ED-XAS during transient hydrogenation of 0.5% CO₂ (1:4 ratio of CO₂:H₂) at 300 °C over Rh/Al₂O₃ and Rh/SiO₂ catalysts. The data is presented as difference spectra implying that a couple of initial spectra have been subtracted from all spectra in order to facilitate the observation of the major changes occurring during the measurements. The top panels show the color coded intensities (blue corresponds to low intensity, red to high intensity) of the XAS spectra versus time. The bottom panels show the XANES and EXAFS regions of selected spectra recorded at the end of CO₂ (red) or CO₂+H₂ (black) pulses.

Figure S2 shows selected HE-XRD patterns recorded at the end of selected CO₂ (red) or CO₂+H₂ (black) pulses during the transient hydrogenation of 0.5% CO₂ over Rh/Al₂O₃ during periodic variation of the feed gas composition between 2% H₂+0.5% CO₂ and 0.5% CO₂ for 10 min at 350, 300 and 250 °C, respectively.

^a Competence Centre for Catalysis, Department of Chemistry and Chemical Engineering, Chalmers University of Technology, Göteborg, 412 96, Sweden Fax: +46 31 160062; Tel: +46 31 772 29 04; E-mail: Natalia.Martin@chalmers.se

^b Division of Chemical Physics, Department of Physics, Chalmers University of Technology, Göteborg, 412 96, Sweden.

^c Division of Synchrotron Radiation Research, Lund University, 22100 Lund, Sweden.

^d European Synchrotron Radiation Facility (ESRF), 38043 Grenoble, France.

^e Deutsches Elektronen-Synchrotron (DESY), 22607 Hamburg, Germany

^f Department of Chemistry, Paderborn University, 33098 Paderborn, Germany.

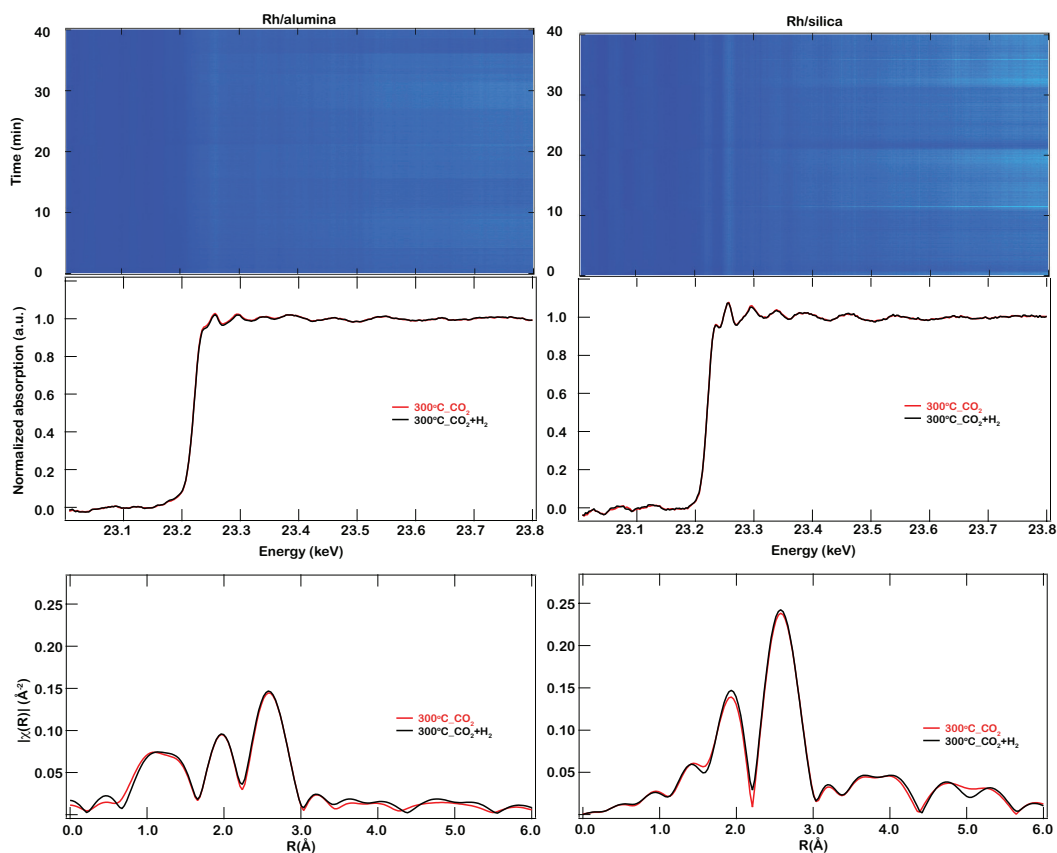


Fig. S1 Transient hydrogenation of 0.5% CO₂ over Rh/Al₂O₃ during periodic variation of the feed gas composition between 2% H₂+0.5% CO₂ and 0.5% CO₂ at 300 °C for 10 min recorded using ED-XAS. The top panels show the color coded intensities (blue corresponds to low intensity, red to high intensity) of the XAS spectra versus time. The bottom panels show the XANES and EXAFS regions of selected spectra recorded at the end of CO₂ (red) or CO₂+H₂ (black) pulses.

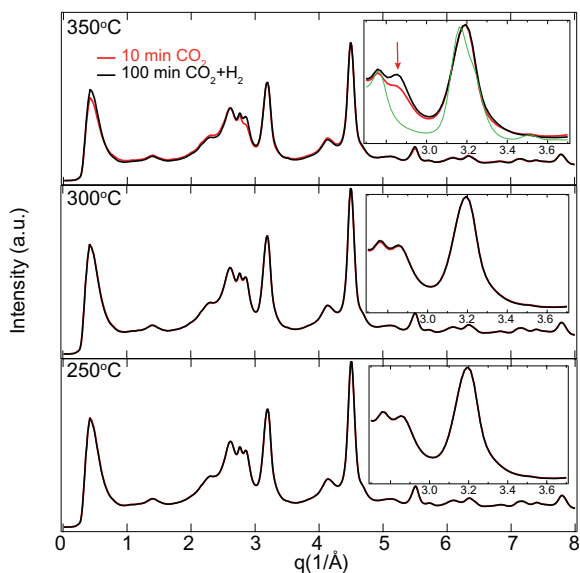


Fig. S2 HE-XRD patterns recorded during the transient hydrogenation of CO₂ over the Rh/Al₂O₃ at 350, 300 and 250 °C, respectively. The selected patterns were recorded after the samples have been exposed to pulses of either 0.5% CO₂ (red) or 2% H₂+0.5% CO₂ (black) for 10 min at the different temperatures. The inset indicates a zoom in between 2.7 and 3.7 Å⁻¹.