

Supplementary Information:

Capturing spatially resolved kinetic data and coking of Ga-Pt Supported Catalytically Active Liquid Metal Solutions during propane dehydrogenation in situ

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Supplementary graphs

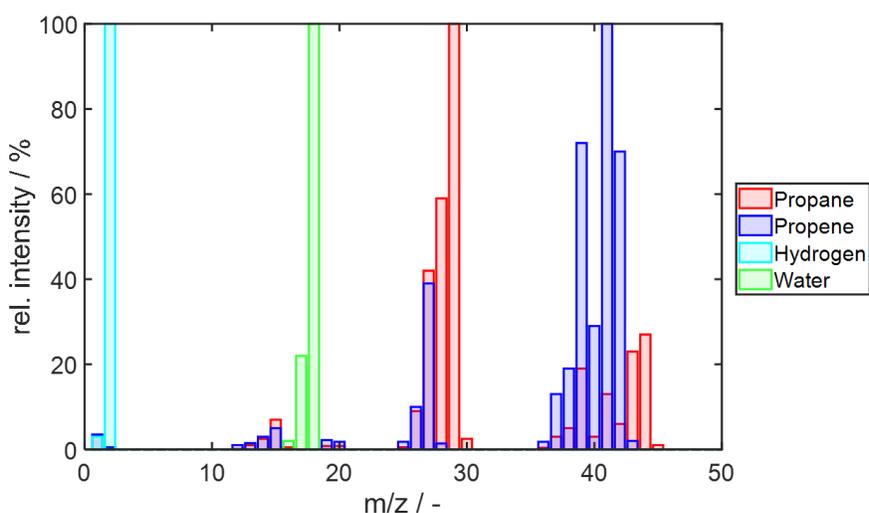


Figure S1: Mass spectra according to NIST¹ of molecules of interest for propane dehydrogenation over SCALMS.

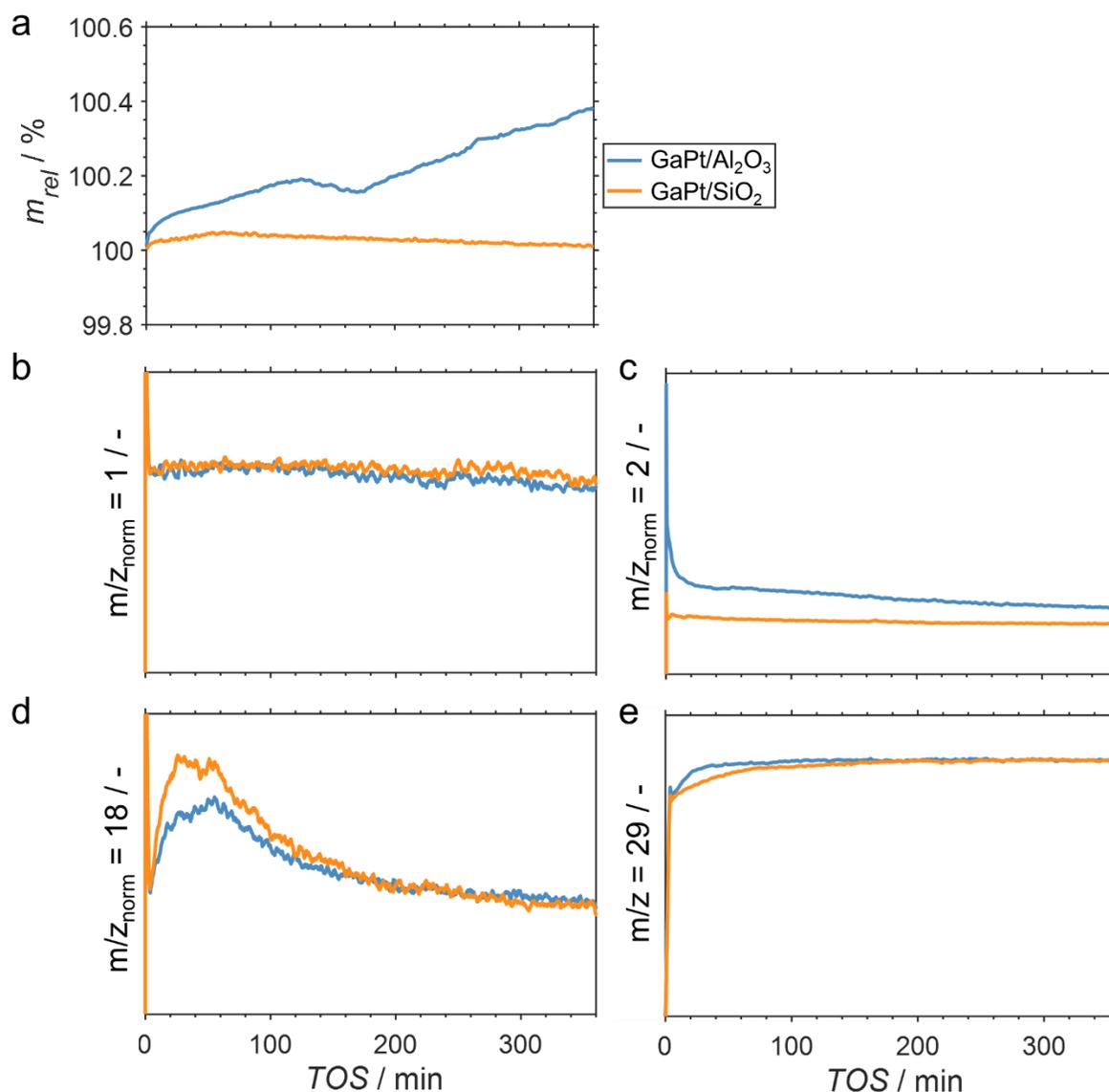


Figure S2: (a) Sample weight relative to the weight of the dried SCALMS during propane dehydrogenation over GaPt/SiO₂ and GaPt/Al₂O₃ SCALMS with atomic Ga/Pt ratios of 55 and 86, respectively, at 450 °C, (b-d) mass-to-charge ratios of 1 (propylene and H₂), 2 (almost exclusively H₂), and 3 (exclusively H₂O) relative to the mass-to-charge ratio of 29 (exclusively propane), and (e) mass-to-charge ratio of 29 (exclusively propane) as monitored via *in situ* high-resolution thermogravimetry coupled with mass spectrometry. Conditions of the experiment: 180 mL_N min⁻¹ He; 20 mL_N min⁻¹ C₃H₈; WHSV 60000 mL_N g⁻¹ h⁻¹.

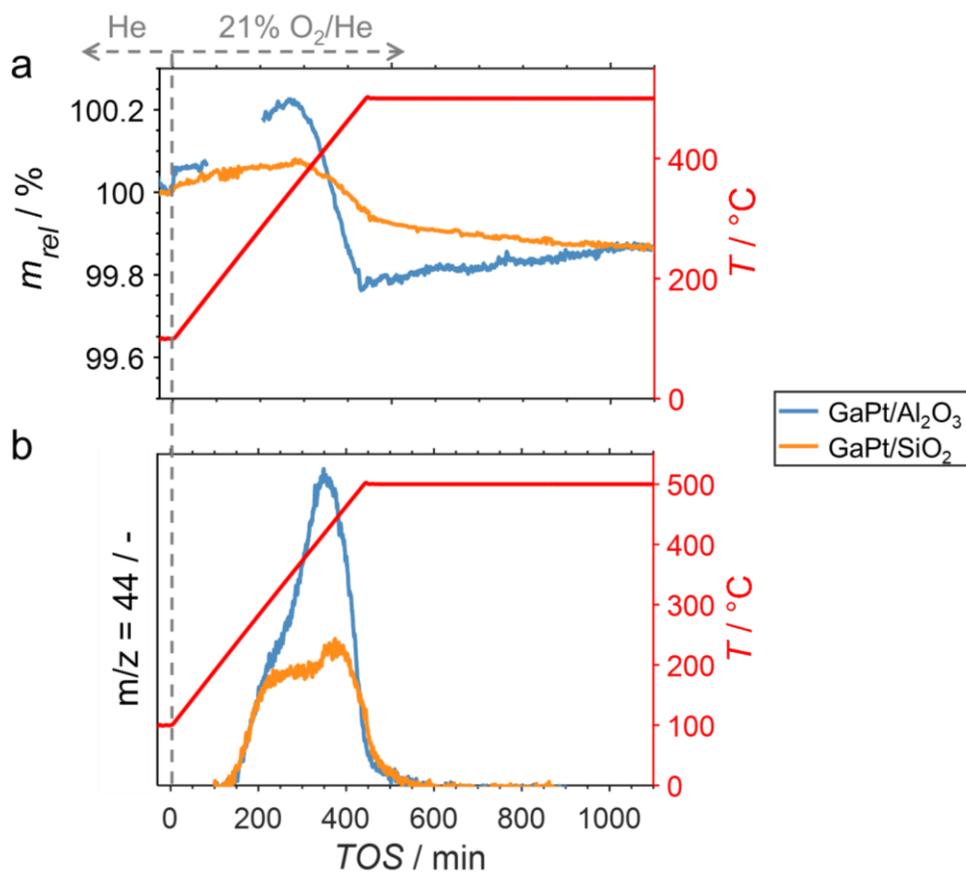


Figure S3: (a) Sample weight relative to the weight prior to exposure to 21% O₂/He at 100 °C and (b) formation of CO₂ during temperature programmed oxidation (1 °C min⁻¹) of spent GaPt/SiO₂ and GaPt/Al₂O₃ SCALMS with atomic Ga/Rh ratios of 55 and 86, respectively, after propane dehydrogenation at 450 °C for 24 h as monitored via *in situ* high-resolution thermogravimetry coupled with mass spectrometry. Conditions of the experiment: 100 mL_N min⁻¹ He (TOS<0); 79 mL_N min⁻¹ He and 21 mL_N min⁻¹ O₂ (TOS>0); WHSV 30000 mL_N g⁻¹ h⁻¹. The authors note a failure of the measurement of the sample weight of GaPt/Al₂O₃ during 80-200 min TOS.

References

1. *NIST Chemistry WebBook, SRD 69*, National Institute of Standards and Technology, <https://webbook.nist.gov>, 2019.