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High-throughput assessment of catalyst stability during autothermal reforming of model biogas

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The long-term stability of Ni-based catalysts for autothermal reforming of model biogas has been assessed in a six parallel-flow reactor implemented to test simultaneously six different catalysts at 700°C under a feed consisting of 42% H₂O, 14% CH₄, 9% CO₂, 7% O₂ in argon. The reproducibility of catalyst performances measured in the 6 parallel reactors was ascertained using a commercial Ni-based catalyst. A screening of 12 catalyst formulations identified 5-0.05 wt.% Ni-Rh/MgAl₂O₄ as a robust catalyst for autothermal reforming of model biogas over 200 h time-on-stream.