

# Development of a robust and efficient biogas processor for hydrogen production. Part 2: Experimental campaign

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## Description

In this study, a robust and efficient decentralized fuel processor based on the direct autothermal reforming (ATR) of biogas with a nominal production rate of 50 Nm<sup>3</sup>/h of hydrogen and a plant efficiency of about 65% was developed and tested. The ATR unit is composed of a structured catalyst support for the biogas reforming close coupled to a catalytic wall-flow filter to retain eventual soot particles.

The performance of the conventional random foam and homogeneous lattice supports structures for the production of hydrogen from the ATR reaction was investigated. 15–0.05 wt%-Ni-Rh/MgAl<sub>2</sub>O<sub>4</sub>-SiSiC structured catalyst and LiFeO<sub>2</sub>-SiC monolith were selected for the conversion of biogas to hydrogen and for the syngas post-treatment process, respectively. For all the experiments, a model synthetic biogas was used and the catalytic activities were evaluated in three different experimental facilities: lab bench, pilot test ...