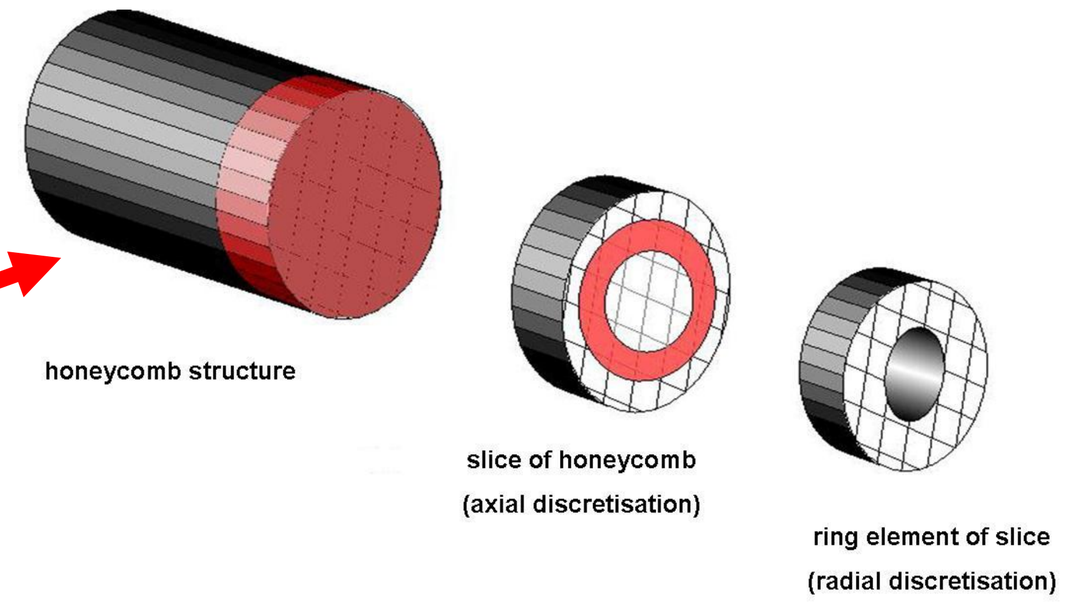

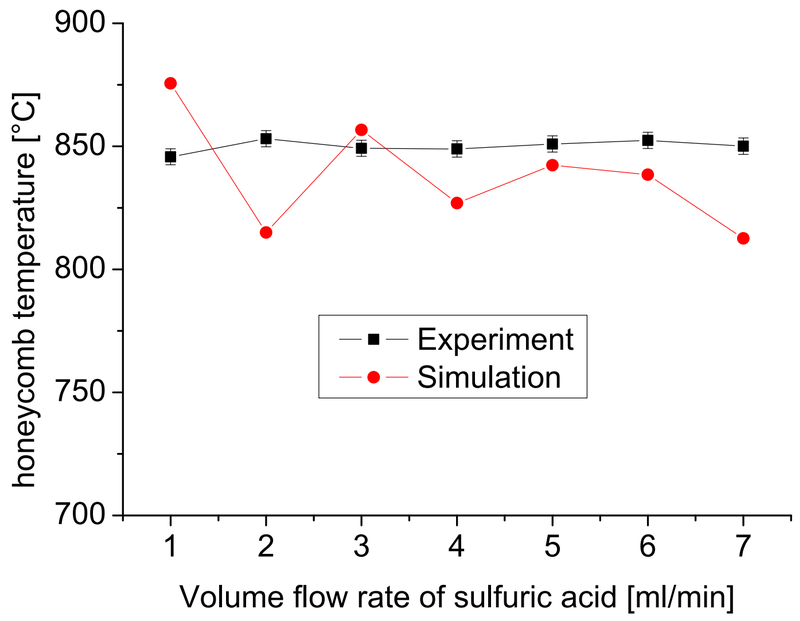

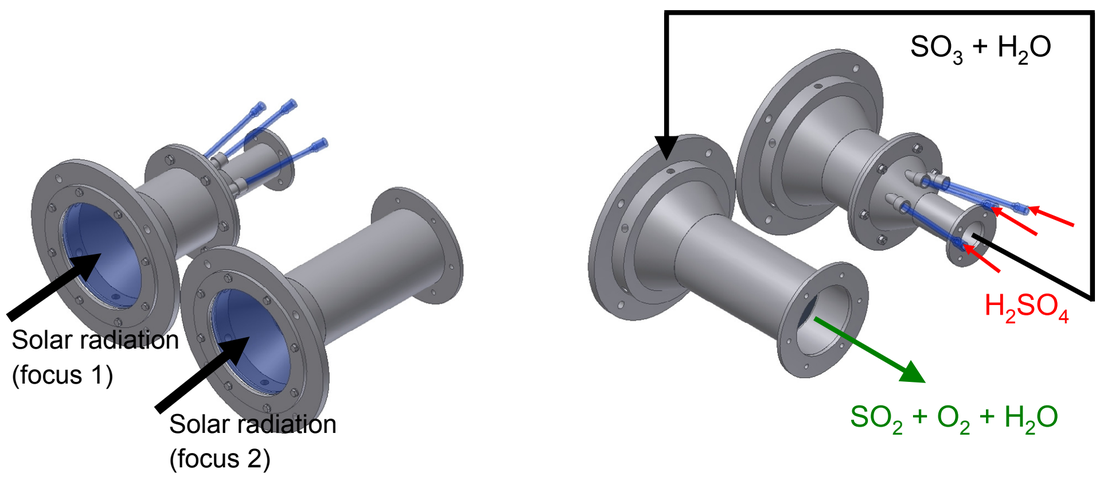

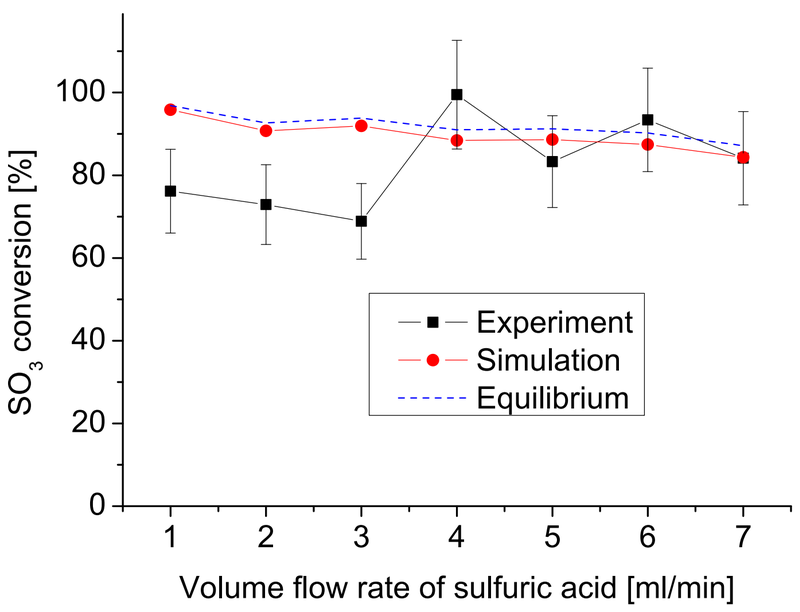

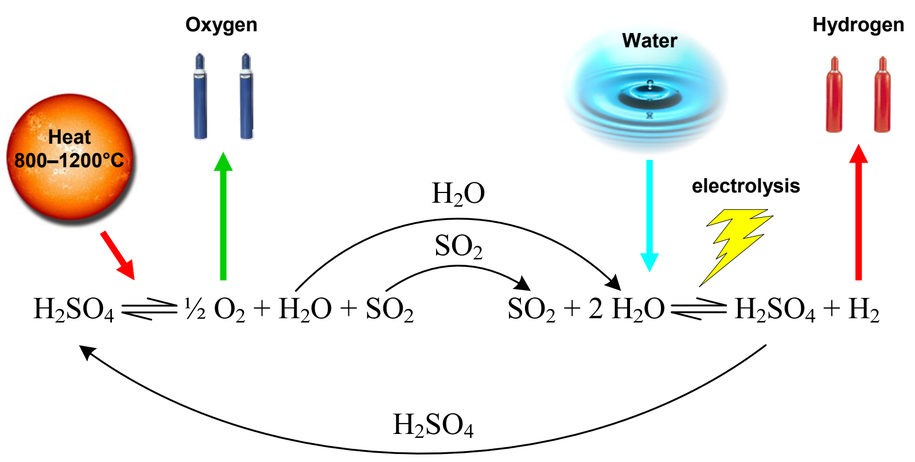

Institute of
Solar Research

Solar thermochemical hydrogen production: Experimental analysis and modelling of a solar reactor for decomposition of sulphuric acid

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The Hybrid-Sulphur-Cycle is a promising thermochemical cycle to produce hydrogen – as a future energy carrier – at high efficiency. For a technical realisation of this process, DLR developed a test reactor for solar decomposition of sulphuric acid during the European project HycycleS. The second reaction chamber for catalytic dissociation of SO_3 was modelled using the software package Dymola®/Modelica®. Validation was successfully performed by comparing the simulation results with experimental data available from systematic testing series in DLR's solar furnace in Cologne. As a result, the model can now be used to simulate the reactor's behaviour for operating points not analysed experimentally and gain an in-depth understanding of the process.