

Fig. 1

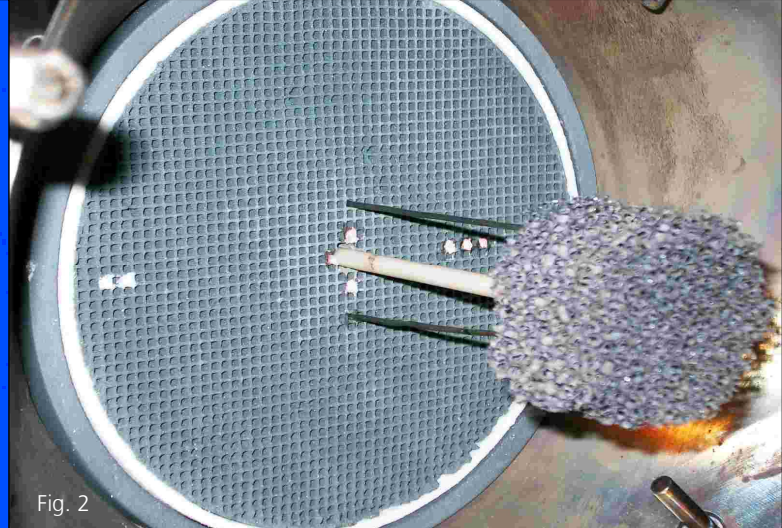


Fig. 2

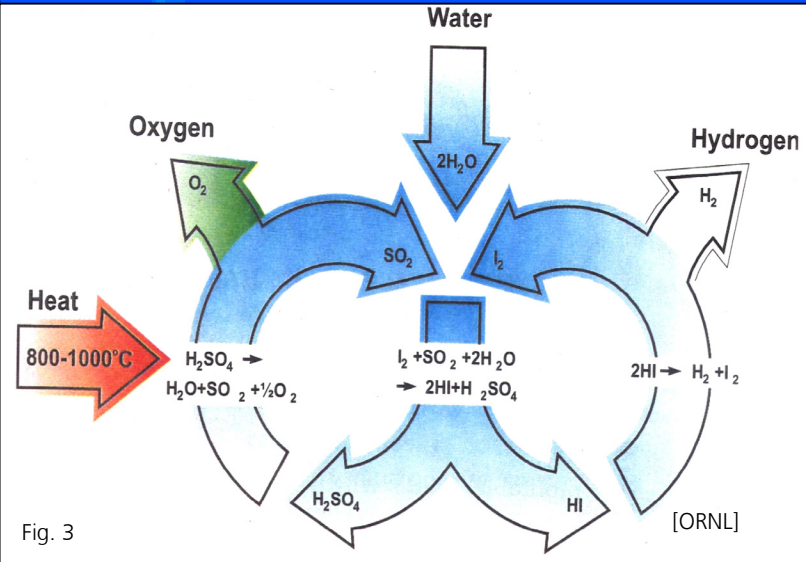


Fig. 3

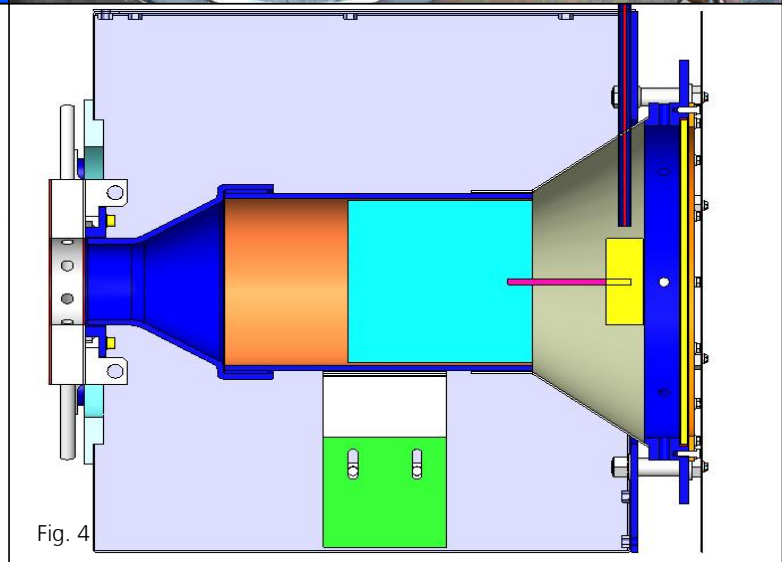


Fig. 4

HYTREC: Receiver-reactor development for solar sulfuric acid decomposition – DLR Contributions

In the EU project HYTREC thermochemical cycles for the mass production of hydrogen are investigated, in particular the Sulfur-Iodine cycle (Fig. 3) and the Westinghouse cycle. Both cycles contain the decomposition of sulfuric acid as the main energy consuming step. DLR has developed a receiver-reactor (Fig. 4) capable to carry out the decomposition reaction by concentrated solar radiation. Two types of receiver-reactors are investigated, a tubular reactor and a volumetric reactor. A feasibility study of the tubular receiver-reactor is being performed. The concept of a porous absorber reactor using ceramic foams and honeycomb structures (Fig. 1 and 2) has proved promising in preliminary tests. It will be used for more detailed investigations on operational behaviour, kinetics, and yield of the decomposition reaction in the solar furnace.

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