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**SOLAR NANOSTRUCTURED CARBON MATERIALS :  
THE 1 MW EXPERIMENT**

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**Abstract :**

The large Scale Fullerene Synthesis Project at the 1 MW Odeillo Solar Furnace is based on four main tasks:

(1) *Material Synthesis at the 2 kW Scale*: Determination of optimum operation conditions, process analysis, material characterization.

(2) *Large Scale Reactor Modeling*: Numerical simulation of heat transfer in the target, CFD modeling of reactor internal fluid flow.

(3) *Cold Mock-up Test and High Temperature Measurements* for reactor concept validation and thermal model fitting.

(4) *Full Test of Experimental Setup* at the focus of the 1 MW solar furnace.

Tasks (3) and (4) are concerned by this paper.

Thermal model fitting was successfully achieved on the basis of measurements at flux densities up to 500 W/cm<sup>2</sup> and front surface temperature of about 3000 K with a 6 cm graphite rod, accounting for non-grey behavior of graphite in the solar and I.R. spectral ranges.

Tests of the full experimental setup are now in progress. The experimental loop is schemed in figure 1. It is composed of the reactor/receiver in which the pressure may vary from 10<sup>4</sup> to 10<sup>5</sup> Pa, a pressurized argon buffer tank (P = 3 10<sup>5</sup> Pa), a circulation pump and a heat exchanger at the reactor outlet to cool down the exhaust gas mixed with soot. The system is connected to a vacuum pump to tune the working pressure. A photograph of the reactor installed at the focus of the 1 MW-Odeillo solar furnace is shown in figure 2.

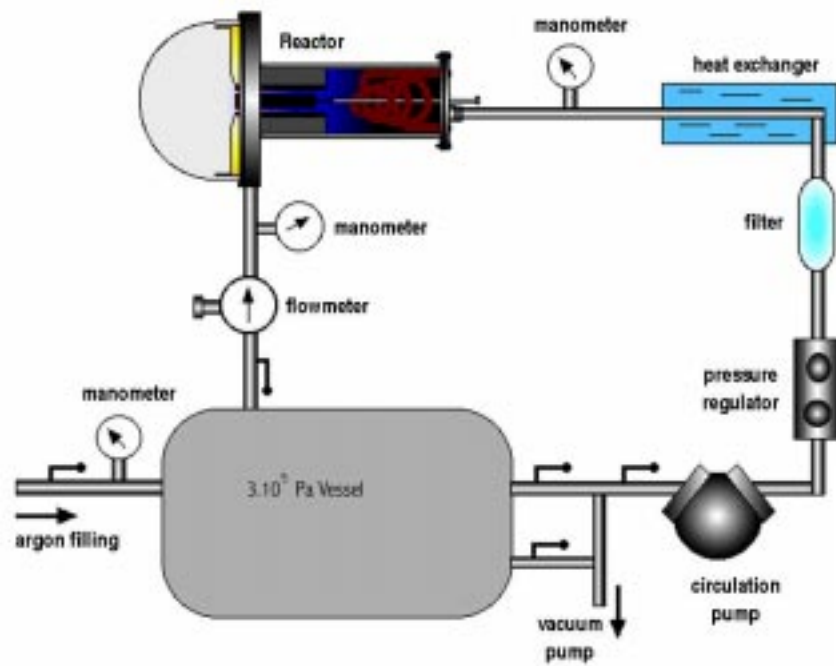


Figure 1: The experimental loop.

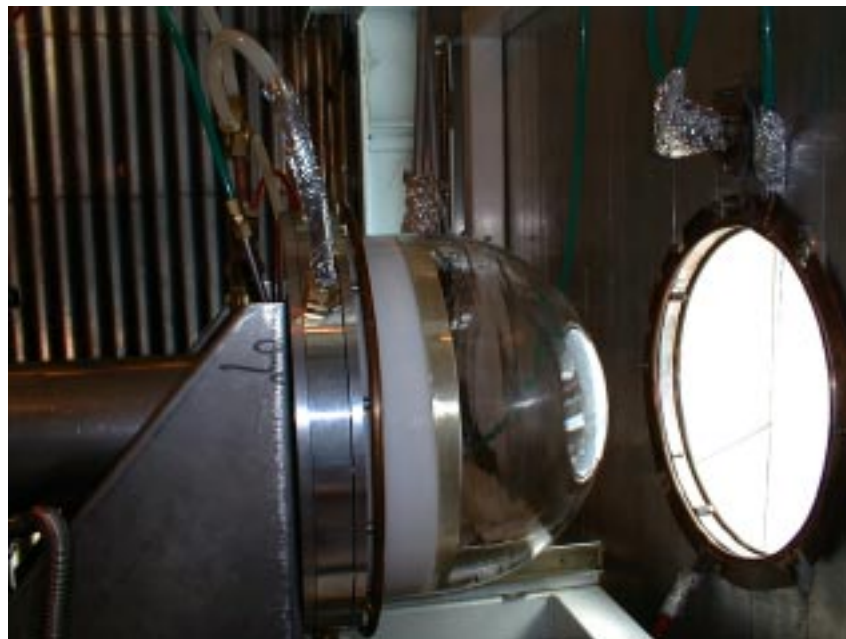


Figure 2: Photograph of the reactor/receiver.