Results of Long-Term Testing of the New Variant of the Rossi Thermogenerator Model

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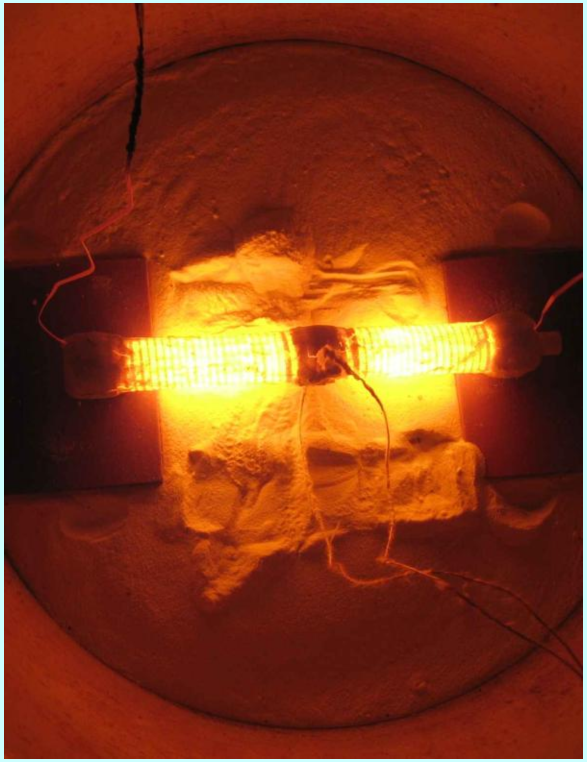
English translation by Bob Higgins and Google Translate

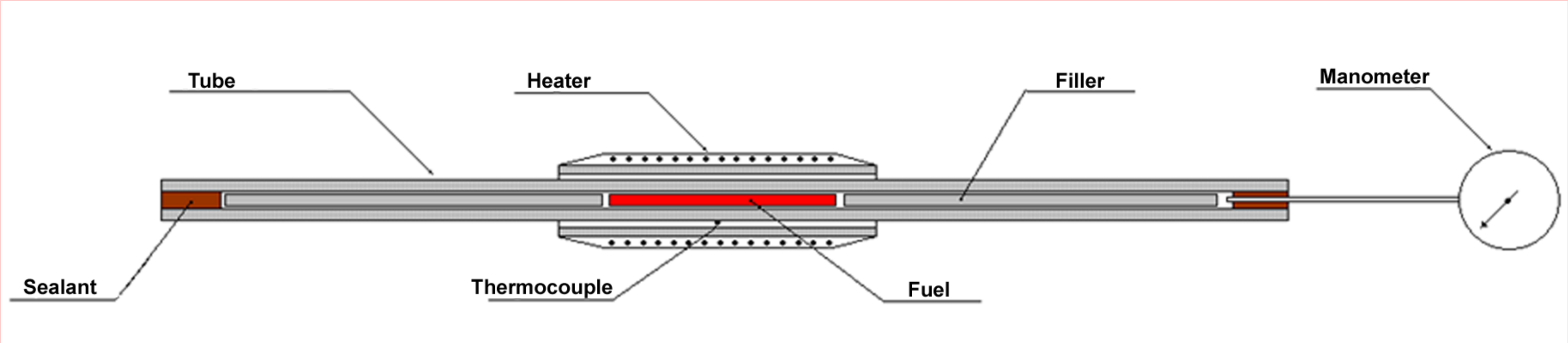


The experiments with devices similar to Rossi's thermogenerator - about which I spoke at the previous seminars - have shown that the mixtures of nickel and aluminum hydride heated in a hermetically closed ceramic tube to temperatures over 1100°C effectively produce heat; significantly more than the electrical energy consumed.

But the working time of these reactors is too short to produce measurable isotopic changes and also to show that the release of the excess heat could be caused by cold nuclear transmutations.

To achieve longer continuous operational duration we had to change the construction of the reactor. First, we had to dispense with the calorimetry used, which was based upon the measurement of the quantity of evaporated water, because it is difficult to manually add water around the clock.

Reactor Design for Long-Term Tests



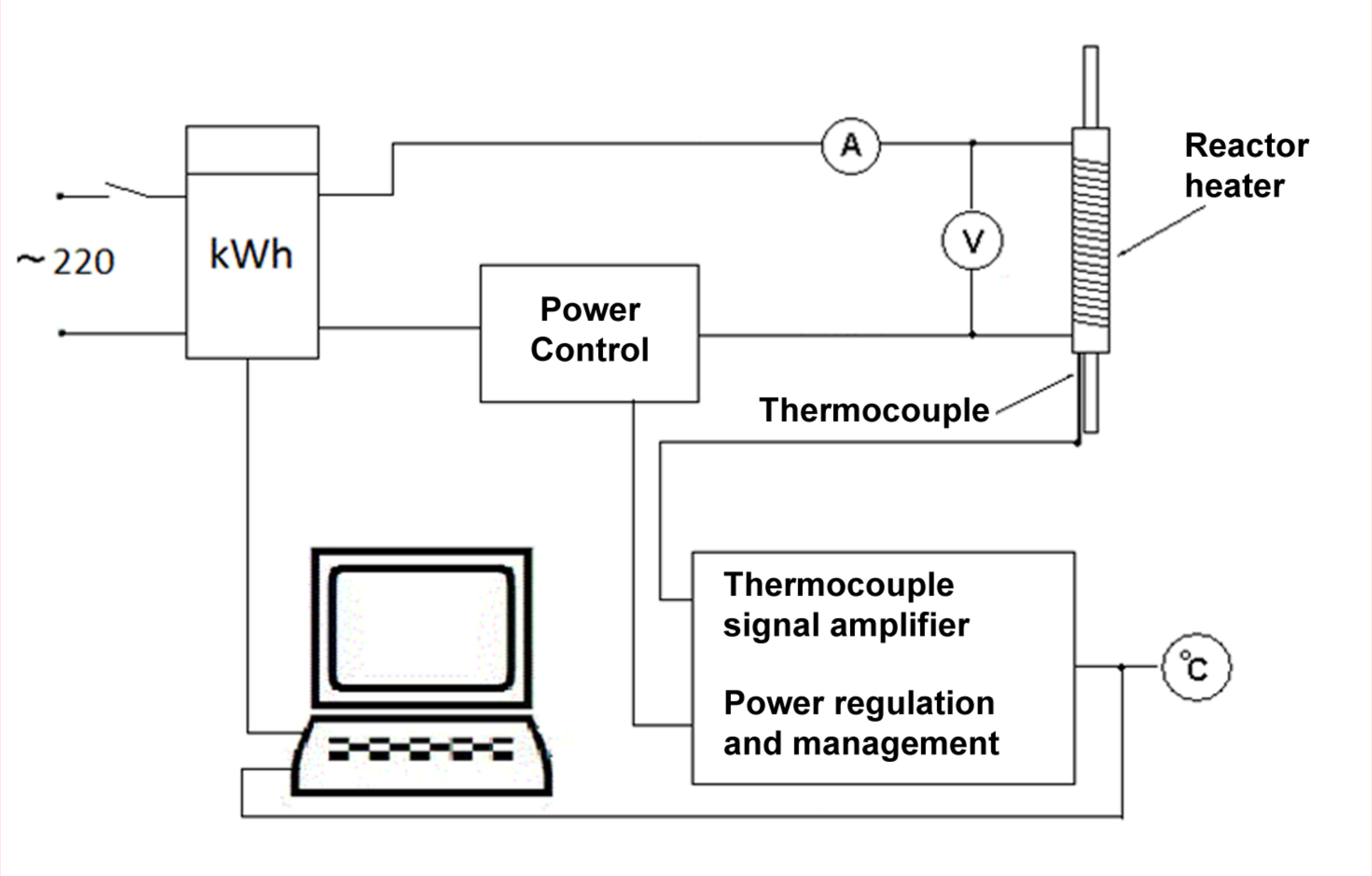
The tube of the reactor aimed for long operation is 29 cm long and only its central part is heated. Due to the low thermal conductivity of the ceramic, the ends of the tube are not very hot (at 1200°C in the center, the ends are only 50°C. This epoxy adhesive to be used for sealing the ends of the tube.

For heating, resistor wire (Kanthal A1) is used which is suitable for operation to 1400°C.

The fuel mixture (640 mg Ni + 60 mg $LiAlH_4$) is in a container of thin stainless steel. Ceramic fillers were used to displace the air from the tube.

The manometer *[Bourdon pressure gauge]*, with a limit of measurement of 25 bars, is connected with the reactor with a thin tube of stainless steel.

Reactor Power and Control

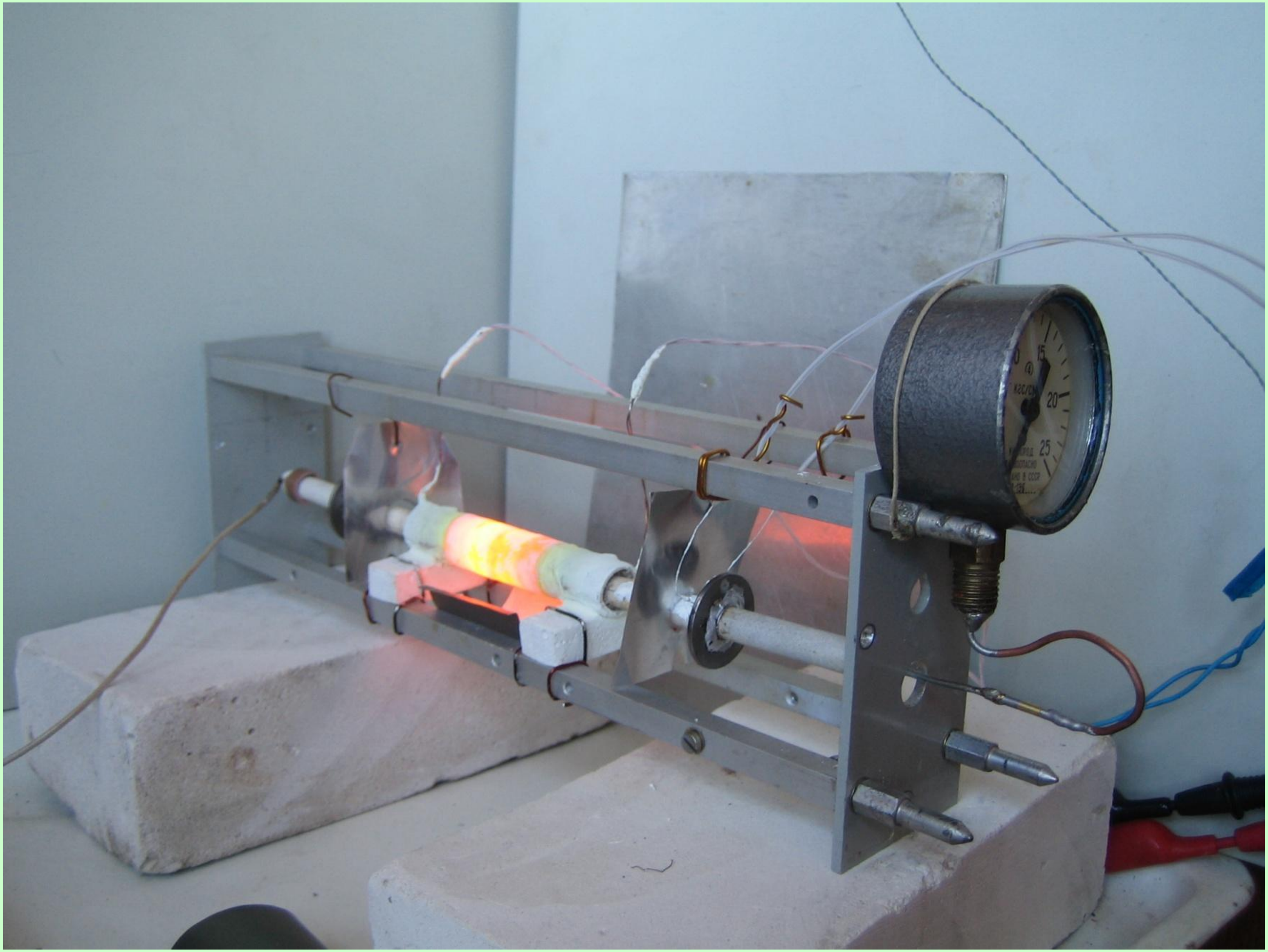


The thermocouple output is monitored so as to maintain the desired temperature.

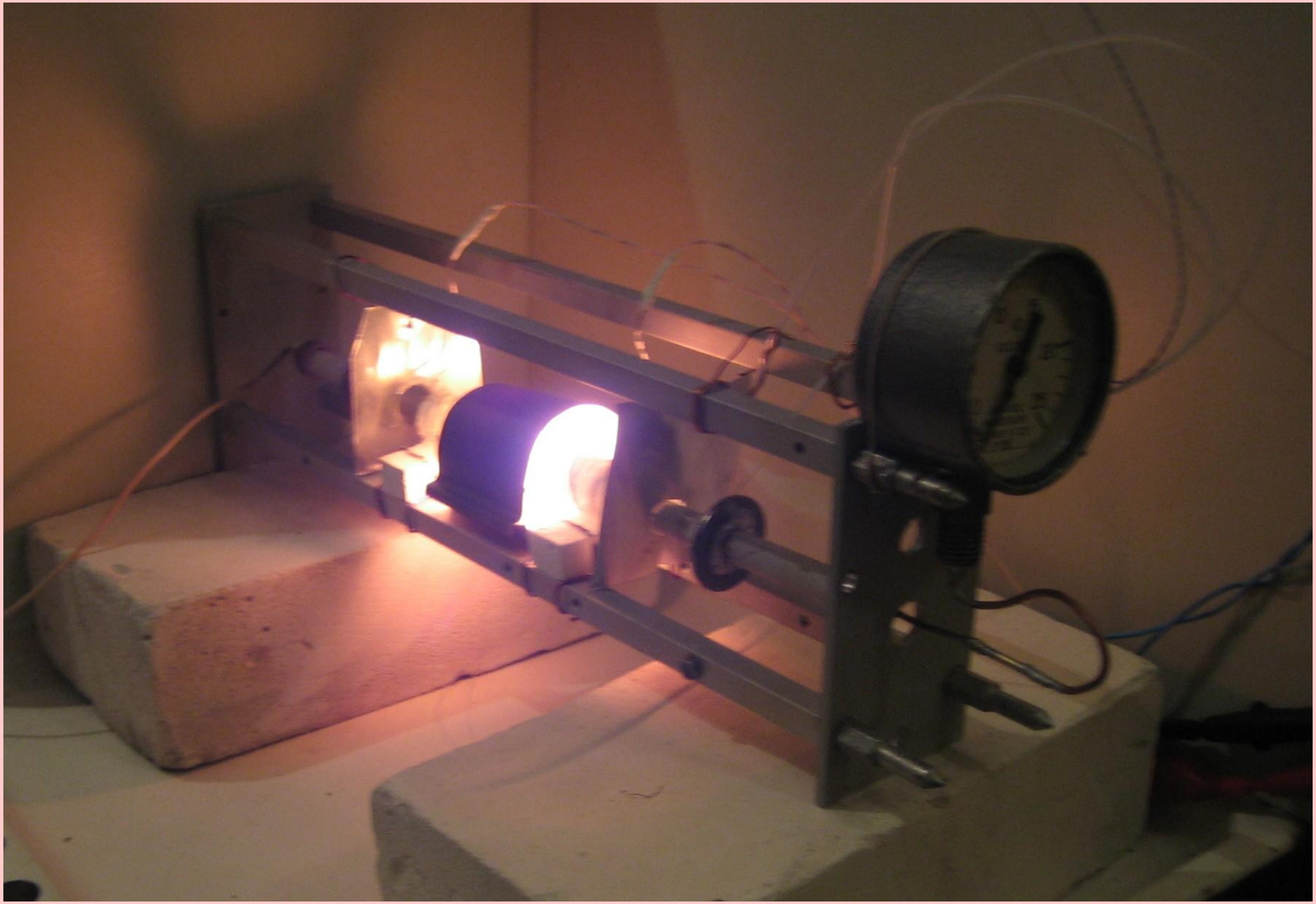
Electrical consumption of the reactor and the temperature are recorded by the computer.

Reactor Ready for Testing

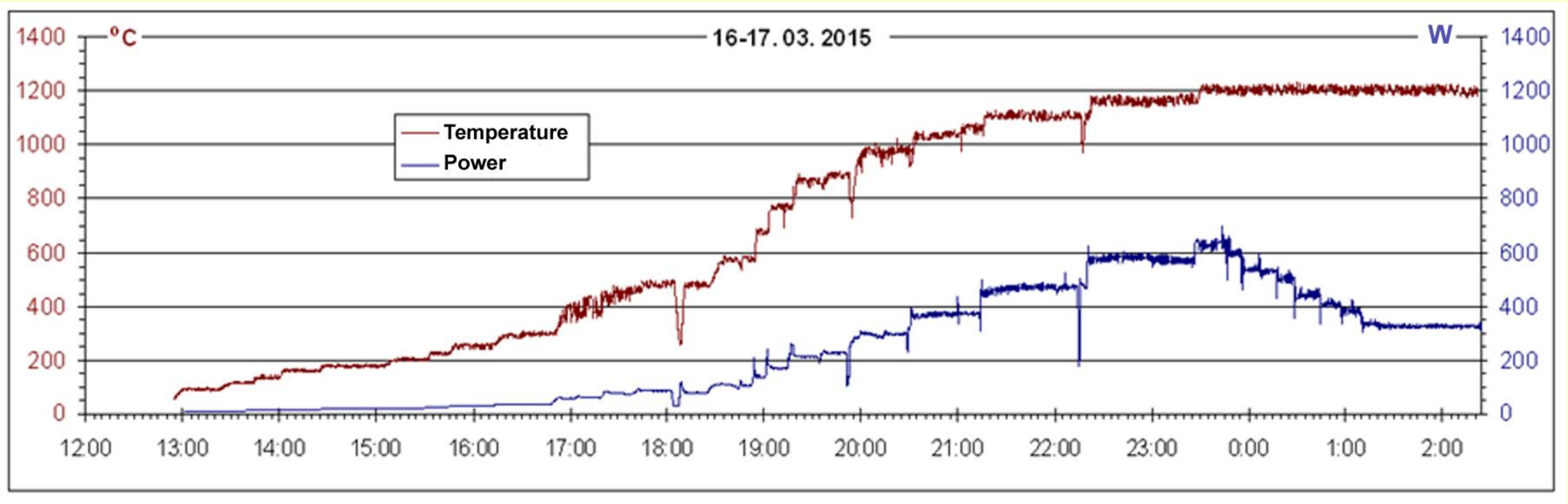
Reactor During the Test



Reactor During the Test



Heating the Reactor to Operating Temperature

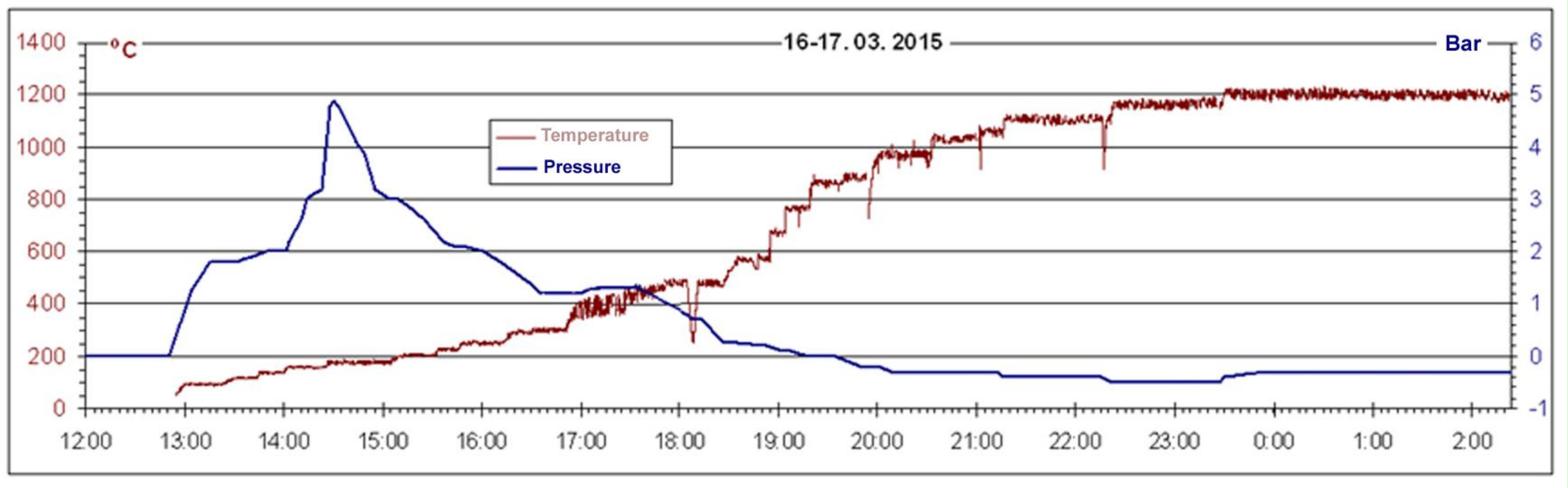


The surface of the working tube was heated to a temperature of 1200°C over the course of 12 hours by stepwise increase in input electrical heater input power to a maximum of 630W.

For almost 3 days the power needed to maintain the temperature of the reactor tube at 1200°C was in the range of 300-400W.

Heating the Reactor to Operating Temperature

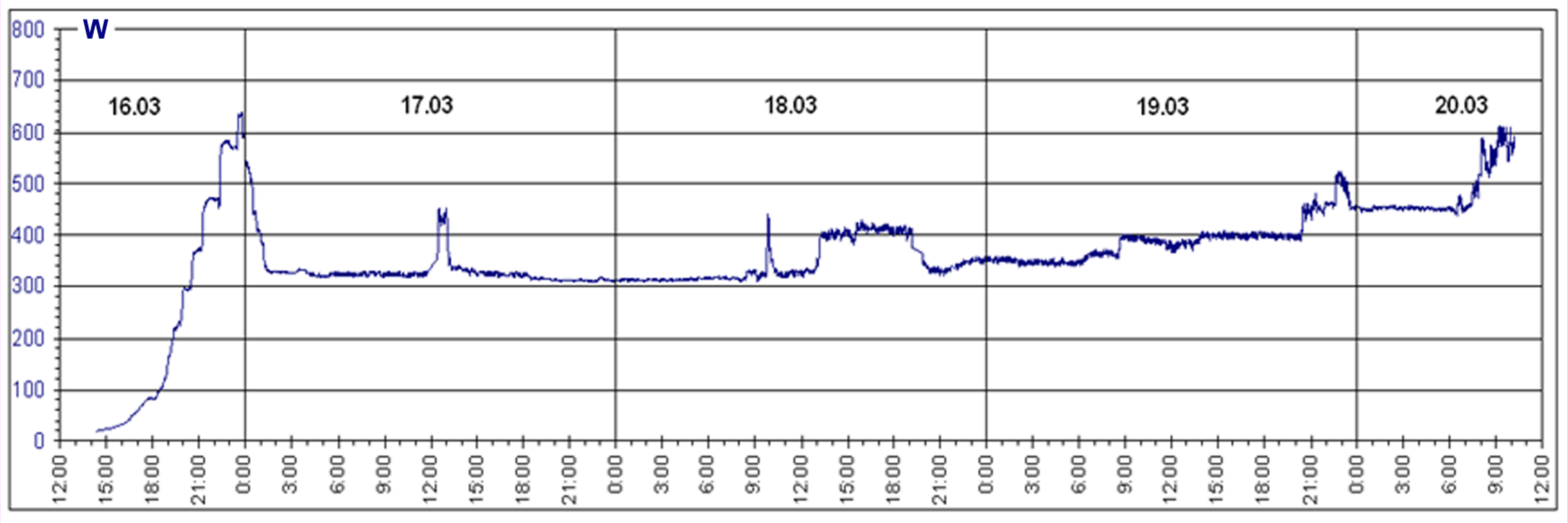
The pressure change in the heating process



Pressure increase began at about 100°C. The maximum pressure of about 5 bar is achieved at a temperature of 180°C. Thereafter, the pressure falls, and at temperatures above 900°C, the pressure is less than atmospheric. The highest vacuum (about 0.5 bar) occurred at a temperature of 1150°C. Subsequently the pressure gradually approached atmospheric.

Electrical Heater Power for 4 Days

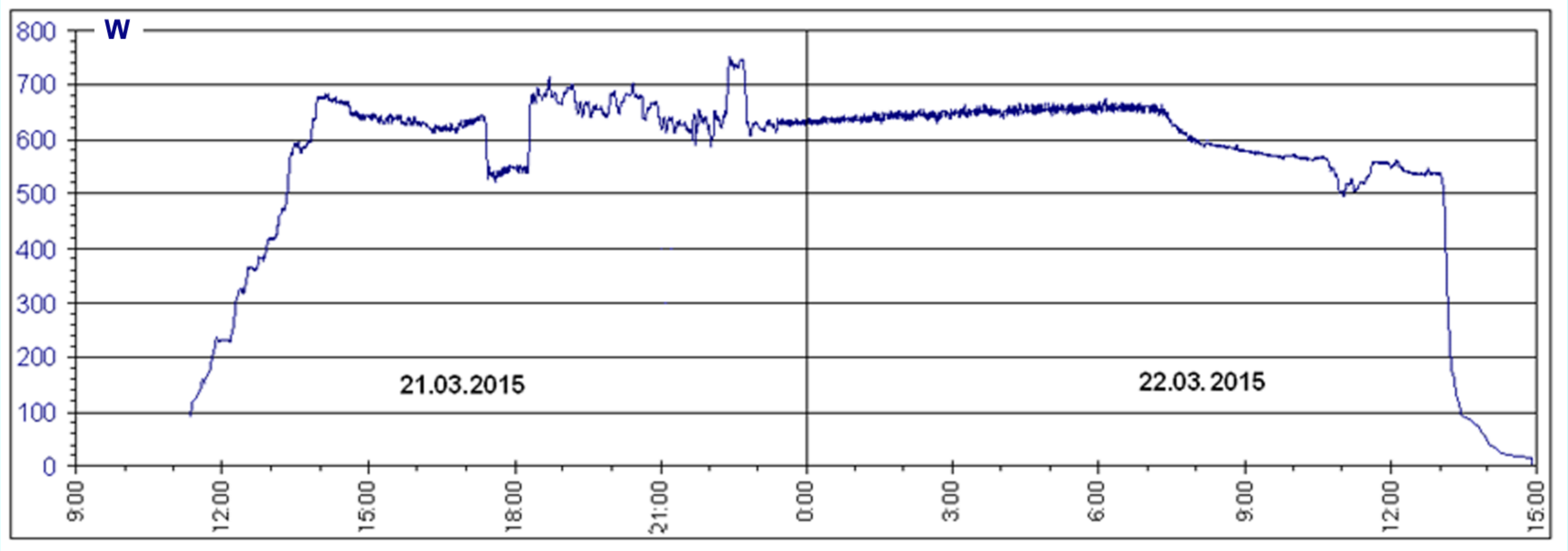
… until the burnout spiral



For almost three days while the temperature of the tube reactor was held at 1200°C, the electrical heater input was in the range of 300 - 400 watts. Shortly before the heater burnout, the controlled power input began to grow rapidly *[trying to keep the temperature at 1200°C]*, and at the time of burnout the electrical heater input was 600 watts.

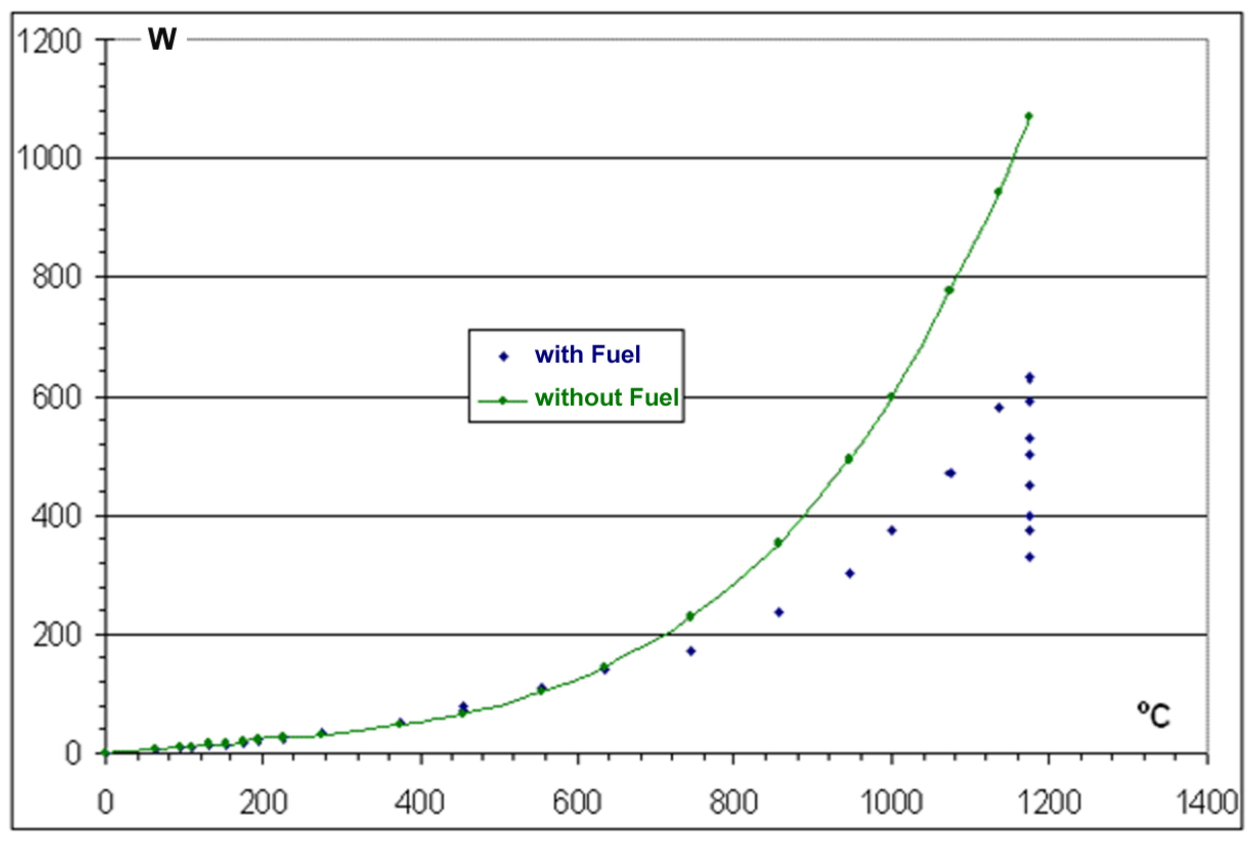
Heater burnout was due to gradual oxidation of the resistor wire.

Operation of the Reactor with a New Heater



The temperature was maintained at 1200°C with an electrical heating input power of 500 to 700 watts.

Power Required to Maintain the Desired Temperature



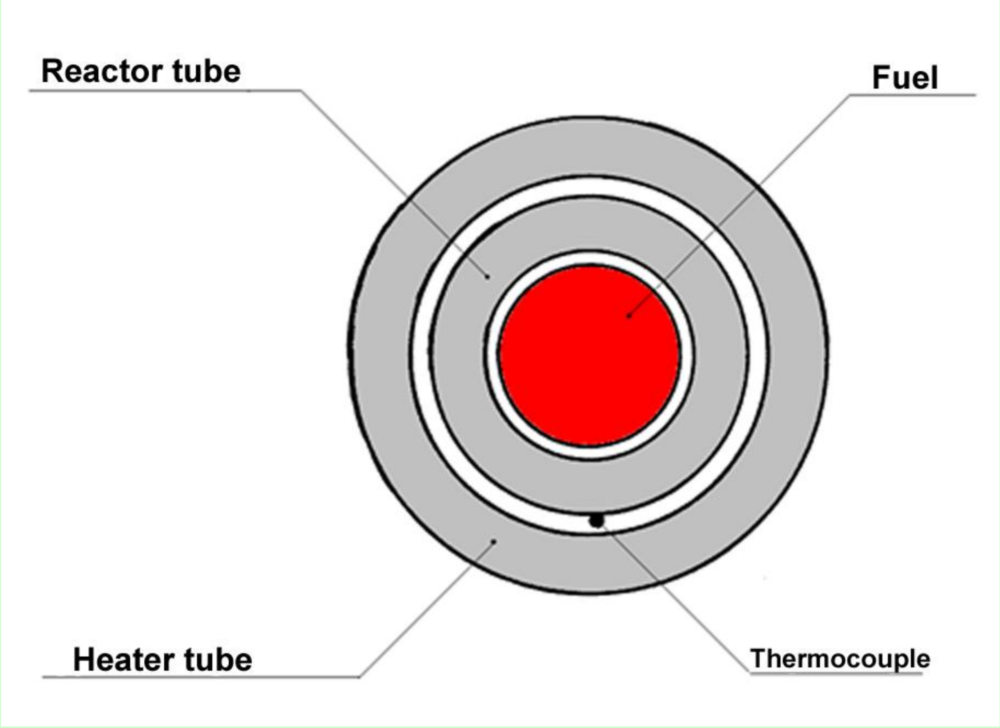
At temperatures above 700°C, the reactor with fuel consumes less power than the same reactor without fuel.

This indicates the presence of a source of heat in addition to the electric heater.

When the temperature reached 1200°C, the power required to maintain this temperature without fuel was 1100 watts. When the fuel was present, the reactor required initially 650 watts, and an hour later the controlled power dropped to 300-330 watts. From this we can estimate the excess energy to be 800 watts.

The thermal coefficient of performance, COP = 1100/330 = 3.3

But this COP is only a rough estimate - not taking into account the difference between the processes with the fuel and without fuel.



In the absence of an internal heat source, the temperature inside and outside the tube should be the same, and the temperature measured by a thermocouple on the outside of the tube should be equal to the temperature of the heater surface.

When operating the reactor with a fuel, heat flow from inside to outside will lead to a temperature gradient. Therefore, the temperature measured by the thermocouple will not be the same as the temperature of the heater surface above.

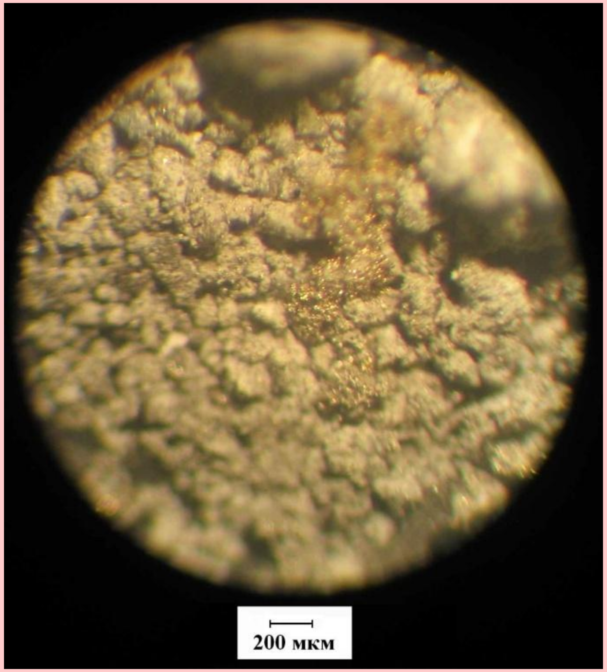
At a reactor tube surface temperature of 1200°C [with fuel producing heat], the temperature at the heater tube is around 1070°C. Thus, the heater controller is only delivering as much heat as was needed without fuel to reach a temperature of 1070°C (800 W instead of 1100).

Given this, the thermal coefficient of performance, COP = 800/330 = 2.4

Ash from the Reaction (Spent Fuel)

Fuel container after removal from the reactor tube. On each side, the ceramic filler inserts.

Fuel *[ash]* after removal from the SS fuel container



Optical microscope view of the spent fuel *[ash]*

Summary Findings

1. The new apparatus was operated continuously for more than 3 days, producing more than 2 times the heat as the electrical energy consumed. The excess energy produced is about 50 kilowatt-hour or 180 MJ. This is approximately equivalent to the heat from the combustion of 3.5 kg of oil.
2. The pressure in the reactor chamber with slow heating is relatively low (in this experiment, a maximum of 5 bar).
3. Spent fuel has the form of small droplets sintered golden brown with a touch of gray powder.
4. Samples of the source fuel and the spent fuel were submitted for analysis of isotopic composition. The results of this analysis, unfortunately, are not yet available.