

DISCLAIMER: NO GUARANTEE IS MADE AS TO THE ACCURACY OF THIS TRANSLATION. THOSE ATTEMPTING TO BUILD THE ATHANOR DEVICE SHOULD SEEK EXPERT ADVICE AND ENSURE THE ORIGINAL ITALIAN INSTRUCTIONS ARE PROPERLY UNDERSTOOD, WHICH CAN BE FOUND [HERE](#)

It is with emotion that we are going to take this step: making available on the internet the construction of ATHANOR. Forgive us for the quality of the image, we hope you'll understand how much we are running. Send us all your questions and with quick replies we will make us forgive the poor quality of the images.

For some reasons we are not yet fully effective in managing the documentation, but we're categorizing everything.

PERFORM ONLY BY AT LEAST TWO EXPERTS, WITH THE APPROPRIATE PROTECTIONS UNDER THE SAFETY RECOMMENDATIONS IN LABORATORIES UNDER A CLOSED INTAKE GLASS HOOD WITH HIGH DILUTION OF SMOKE.

GATHER CAREFULLY THE RESIDUALS FOR A SUITABLE WASTE DISPOSAL OF LIQUID AND SOLID

IT IS ABSOLUTELY NOT RECOMMENDED, AND WE ARE NOT RESPONSIBLE FOR IT, TO OPERATE IN THE PRESENCE OF INCIDENTAL SPARKS OR FREE FLAMES BECAUSE OF EXPLOSIVENESS BOTH OF HYDROGEN AND OF DUST IF THE FUNNEL SHOULD DRY INSIDE, NOT PROTECTING THEM ANYMORE IN THE FORM OF MUD.

THE INFRINGING OF THESE RULES AND OF THOSE OF CAUTION TO USE IN THOSE SITUATIONS CONFIGURATES LIABILITIES THAT EXONERATE THE ALLOCATION OF THEM TO US.

WE CARE ABOUT OUR LIABILITY JUST AS MUCH AS WE CARE OF YOUR HEALTH. (INSERT A RED BUTTON SWITCH THAT DISCONNECTS BOTH POLARITIES AND CHECK THE CIRCUIT BREAKER OF THE SYSTEM).

IT IS RECOMMENDED TO SURROUND THE CELL WITH LEAD SHEET, TO PUT A THICK PLEXIGLASS PLATE BETWEEN THE CELL AND A WEBCAM WITH THE WIRE SHIELDED WITH ALUMINUM FOIL, BUILD A WALL OF WATER BY RECTANGULAR CONTAINERS THAT SURROUND THE CELL COMPLETELY, INSERT A GEIGER COUNTER CLEARLY VISIBLE BY THE WEBCAM AND OPERATE IN A REMOTE STATION WITH 6 SQMM SECTION CABLES.

WHOEVER BUILDS AND OPERATES THE DESCRIBED EQUIPMENT IS FULLY RESPONSIBLE EVEN AGAINST DAMAGE TO THIRD PARTIES, EXPRESSLY EXEMPTING THE AUTHORS OF THIS TEXT FROM ANY LIABILITY.

THE SIMPLE IMPLEMENTATION OF EXPERIMENTATION, BOTH AS DESCRIBED HERE OR IN FREE FORM, IS AN ACT OF UNCONDITIONAL ACCEPTANCE OF WHAT IS ADVISED HERE.

WE FORMALLY WARN PERSONS NOT TO OPERATE THE EQUIPMENT IF YOU DON'T HAVE A TECHNICAL DEGREE OR EQUIVALENT EXPERIENCE.

GOOD EXPERIMENTATION, and may you soon achieve yields higher than those detected by us!

In the following description please refer to the image below

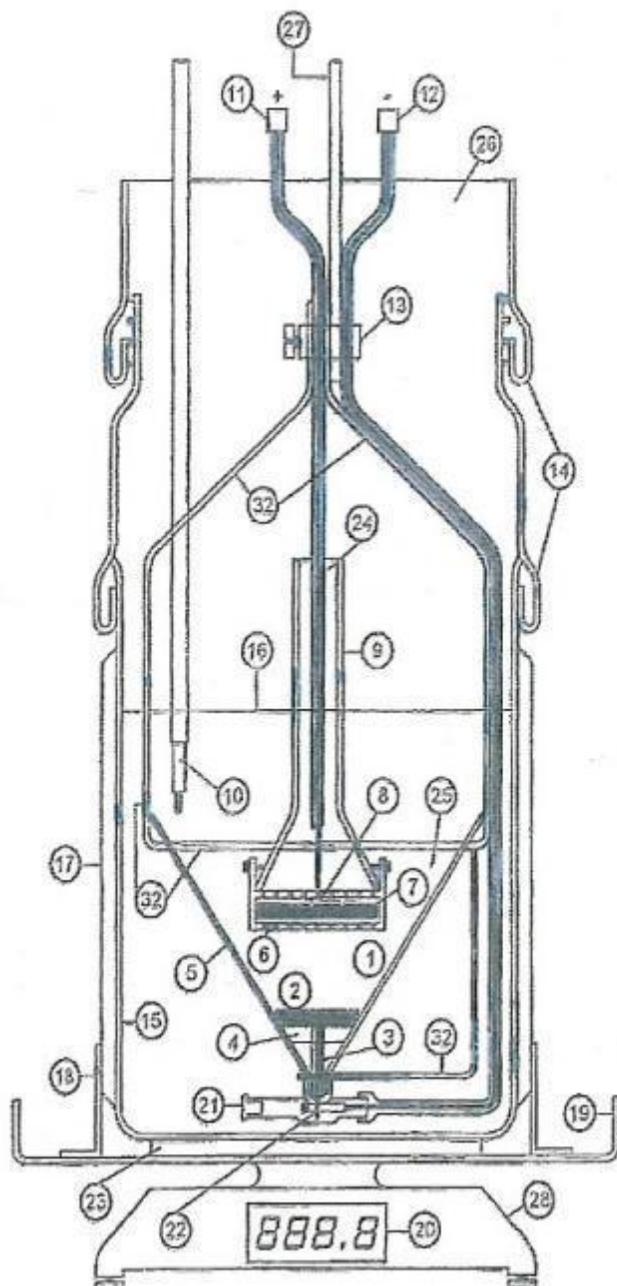


Diagram Explanation

- | | | |
|--------------------------------|-------------------------------|--|
| 1. Reaction Chamber. | 12. Cathode joint | 23. Insulating plate |
| 2. Tungsten powder | 13. Lock | 24. Oxygen outlet |
| 3. Tungsten cathode. | 14. Splash wand (?) | 25. Hydrogen and steam outlet |
| 4. Ceramic plate. | 15. Borosilicate vessel glass | 26. Vessel inlet |
| 5. Borosilicate glass | 16. Electrolyte level | 27. Sustaining rod |
| 6. Teflon grid | 17. Insulating jacket | 28. Balance |
| 7. Borosilicate porous filter. | 18. Lock | 29. *(actually #32 in the diagram) Electrode support |
| 8. Stainless steel grid | 19. Liquid wall (?) | |
| 9. Borosilicate glass tube | 20. Balance display | |
| 10. Thermocouple | 21. Admittance plug | |
| 11. Anode joint. | 22. Cathode lock | |

**It is unclear why the numbering in the diagram goes from #28 to #32*

The apparatus, can be easily made and is absolutely not expensive, consisting of a suspended crew with a bar (27) to an external support, and of an open container (15), pyrex, with capacity of 1000 ml, containing a high splashguard (14). The support should allow the easy put on the same axis of the crew.

The container is on a scale (28) with collecting plate (19) of potential drops so they continue to weigh.

The display (20) is protected by drops; on the bottom of the container there is an insulator (23) (between dish and container). The reactor has a cylindrical removable insulation (17).

It is filled with about 900 ml of solution 0.1 – 0.4 molar of potassium carbonate in distilled water.

A set of thermocouples (10) measures the temperature range (which is not uniform).

On the plate, special locks (18) prevent the container to move with the strong action of the plasma.

The anode (8) is made of a stainless steel mesh of the approximate area of 13 sq. cm., interchangeable with grids of different sizes, positively fed from the connector (11) by means of insulated (or isolated?) stainless steel bar. The pyrex tube (9) allows the insulated (or isolated?) leakage of oxygen from the anode, through the outlet (24).

The cathode connector (12) feeds, by means of a stainless steel bar covered with Teflon tube surrounded by heat shrink tubing, the clamp (22) that blocks the bar cathode of tungsten interchangeable of 1.6 mm diameter.

Particular attention must be paid to the implementation of the protection of the terminal from the electrical contact with the conductive solution.

The cap (21) makes access to the screw for clamping the cathode (3) in the terminal.

The ceramic plate (alumina) (4), crossed by the cathode, and 'glued to the Pyrex funnel (5) by means of high temperature epoxy resin.

On the plate is placed a mixture of tungsten needles (length 3 -5 mm and diameter 0.1 mm) of 2-5 grams and powders, in the form of mud, the grain size between 100 microns and 50 nanometers, in variable proportions, of the weight of g. 1 to 2.

It is therefore evident that it is necessary to keep the powder in the form of mud, opening the container of the supplier under water (distilled), wearing anti-dust and anti-smoke masks specifically suitable (ask the supplier of the filters), using however teaspoons of plastic to limit the triboelectricity ' , after building a plexiglass panel with holes and sleeves of manipulation to fit between the hood shutter and plane, with appropriate gaskets.

NEVER LEAVE ANY DRY DROPS OR SKETCHES OF MUD (PREVENT IN ANY CASE), PENALTY THE RELEASE IN THE AIR (THE FINE POWDERS ARE TOXIC AND SELF- INGNITABLE)!

STORE CLOSED THE QUANTITY OF MUD STOCKED.

NOTE: We never had any accident, not even the slightest, we broke a beaker by washing.

The funnel is supported by the support (32), fixed to the bar (27) from the retainer (13). The level of of electrolyte (16) must be maintained in the area indicated, with short reaction times (typically 90 to 240 seconds), so that the level does not vary too much, introducing changes in buoyancy, thus affecting the determination of the weight of the container, although initially calibrated .

A Teflon grid (6) and a housing encapsulating the cathode grid, protected at the bottom by a porous filter made of sintered pyrex (7).

The vertical distance between the surface dust and anode is typically (adjustable) between 30 and 45 mm.

The monolithic cathode (3) must protrude a few mm from the ceramic plate, just to give contact to the needles which, in turn, give it to the powders.

The operating voltages, typically between 60 volts and 240 volts, are obtained, with direct current, by means of rectifiers mounted on a finned base, downstream of a VARIAC connected to the mains.

The typical operating currents vary between 9 and 0.2 Ampere.

The solution may be preheated before entry into the container (enter it slowly into the funnel and allow the overflow into the container), or taken up to temperature of electrolysis.

Typical protocol suggested in early experiments (everyone will refine it or improve it):

Made a plan of combinations of parameter values, we fixed a set (nominal voltage, type and amount of dust, anode surface, interelectrode distance, electrolyte concentration (attention, it has $\text{pH} > 11$));

Make a calibration diagram by the introduction of the same amount of electrolyte at 100 degrees centigrade, without tension, noting, without insulation of the container, for each degree of descent, the corresponding time, so as to calculate the power lost in water by adduction from the walls to the outside, and by evaporation;
Trace the curve Lost Power (y) – electrolyte temperature (x);

after setting the shielded wire thermocouples, calibrated the scale, entered the liquid at least 85 degrees, turned on an ammeter (position 10 amps max) in series with the cell on rectified current, and a voltmeter in parallel, you can gradually increase the tension.

Raising the voltage, it is noted that the current is high, and the manual tension rise of the VARIAC knob must be adapted to maintain the current under 9 Amperes, while the solution is heated, you notice that you can raise the tension without exceeding with the current; at about 90 degrees, it becomes easy to have low currents (depending on the set of parameters, even only 0.3 amperes); Try to turn on the plasma by bringing the tension at about 120-160 volts; make practice with the adjustment of the Variac knob, not believing the indication of this, but to that of the voltmeter; bring, with the heating of the plasma on, the temperature of thermocouple visible by webcam at about 93 degrees, and “drive” the “wheel” of VARIAC so as to maintain the temperature in a very narrow range around 93 degrees, trying to have the minimum voltage which keeps the plasma stable, checking that the current is as low as possible.

Having taken confidence with the first preliminary tests, you can try an evaluation of yield:

conservatively, ignoring the precious hydrogen produced (and the energy that may be available), integrate in time with the details of the reaction duration (90 – 240 seconds) the measurements of electrical power input ($V \times I$) frequently sampled for direct reading (in the orientation tests) and later with computerized reading, getting the energy input.

The energy lost is obtained by the calibration diagram, at a temperature kept constant, by integrating the power for the execution time of the test.

The difference between energy lost (big) and injected (minor) is the excess.

THE COP can then be calculated, but you must pay attention to the ambiguity. We invite you to calculate it as ratio between energy lost and the one you entered, as the energy lost will be the one to be recovered for use (we propose a standard calculation to compare the results of different experimenters).

It is recommended to cross these determinations with independent readings such as the calculation of sensible heat when the temperature varied, and always check the amount of the evaporated solution, counting the corresponding latent heat (DO NOT EVAPORATE TOO MUCH SOLUTION IN A SINGLE TEST!).

A digital power meter can be used, placing it between the network and the Variac, between the Variac and rectifiers, between the rectifiers and the cell, establishing a framework of reference and comparison with measurements made with simple ammeter and voltmeter continuously (I have a doubt, maybe they mean with direct current).

It should also be made a comparison with exercise, identical, of the reactor with a carbon cathode (without metal powders), inert with respect to the “alleged” fusions or other events catalyzed by transition metals, the mix of dusts, when used with metal cathodes, may contain iron micrometric catalyzing powder, to catalyze the presence of atomic hydrogen rather than molecular.

ONLY the evidences that overall show a coherent picture among the independent readings described can be considered.

We are immediately available to talk about the construction, materials, geometry, planning and execution of tests, the interpretation of results, on which the network will be updated in a realistic time.

Let's start with participatory and distributed science!

(Some will say that this is the opposite of science [ed. Someone will tell for sure!])

A big thank you to all those who will collaborate in any form, and to Dr. Passerini, who will certainly liaison among experimenters and between us and the experimenters.

P. S. Forgive the prolixity ... as a professor.

Rome, 3,30 a.m.

Ugo Abundo