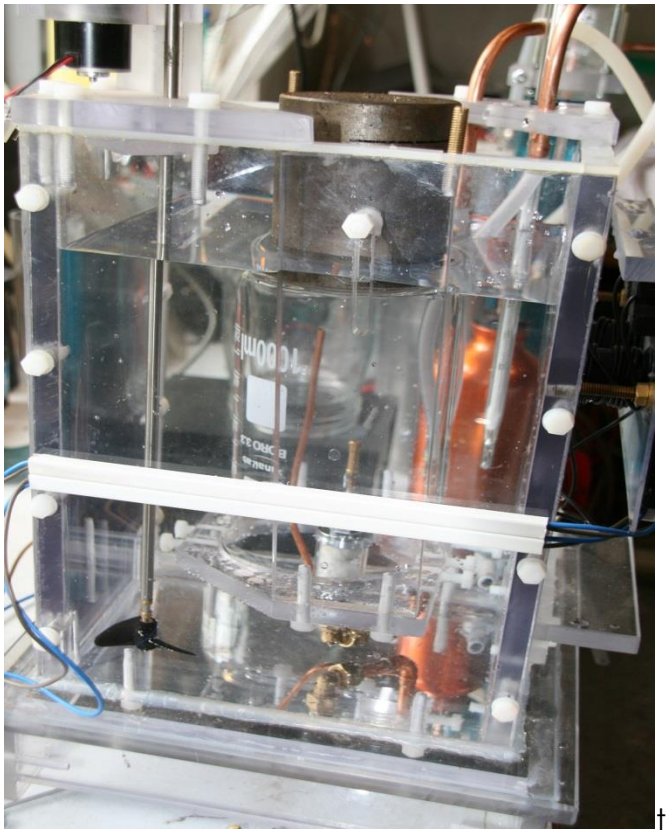
HHO COMPARITIVE CALORIMETRY – 6 MONTH REPORT. Alan Smith 26 Oct 2014.

It has been rather abruptly brought to my attention that some of you have not seen the occasional updates I have been providing on progress with this experiment. Time flies when you're having fun, they say, and it also flies when you aren't! Hard to believe I have been working on this for 6 months less time off for bad behaviour. For those that missed stuff, here's a picture of the Mk1a version of the test tank.



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1. THE BUSINESS END.

This is the total immersion calorimeter, where the oxy-hydrogen gas from the electrolyser is turned back into water. The tank is made from 12mm thick bullet-proofing plastic- Lexan polycarb. This material was chosen with transparency and safety in mind.

The tank is full of water, and contains an electric stirrer. Not visible are two electronic and one mercury thermometer. The Oxy-H recombines inside the inverted air-filled glass beaker visible inside- but more about that shortly.

2. THE GAS OUTLET.

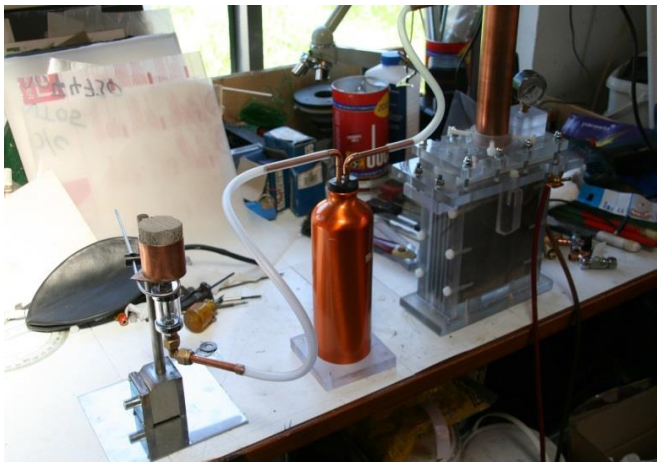
This shows the gas jet assembly working outside the tank. Oxy-H is piped into the flame nozzle taken from a jeweller's oxy-propane torch. Normally the flame is almost invisible, but here you can see it because the nozzle has picked up a little carbon from the burning paper.

WHAT'S IT'S FOR - IN BREIF.

The purpose of the experiment is to investigate the hypothesis that the catalytic recombination of Oxy-hydrogen produced by electrolysis liberated more heat energy than would be created simply burning it in the form of a flame. Various suggestions have been made as to why this might be the case, many of which involve the possibility of an LENR reaction taking place on the catalyst substrate.When we perform a test-run of the system, heat from Oxy-H recombination passes through the walls of the reaction chamber and into the water around it. For the same volume of gas produced by the electrolyser we would –if the hypothesis is correct – expect to see a faster rise in water temperature using catalytic recombination than simple burning. We can ensure the gas volumes are comparable for these two different tests by using the same electrolyser and calorimeter parameters and the same gas outlet nozzle in the chamber for all the test runs.

3. Mk1 TO Mk 111….

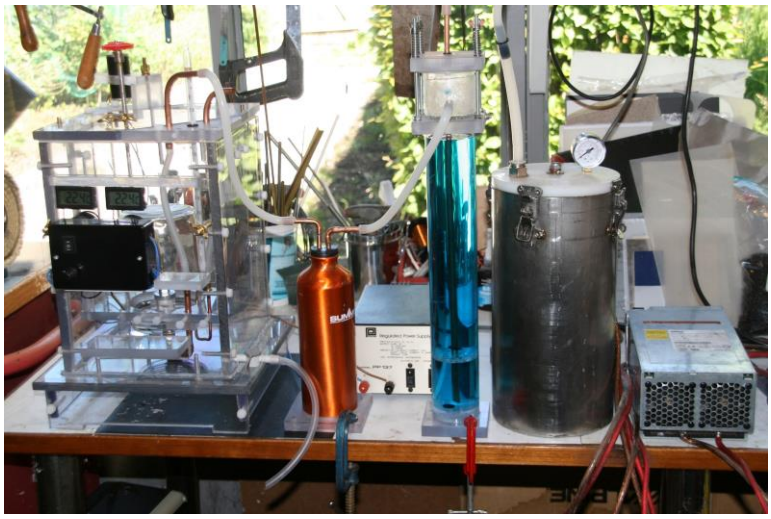
Using a mason jar as a see-through 'hot space' seemed a good idea. Sadly mason jars, even lab-grade beakers (borosilicate glass) can't stand the 5000F temperature spread between flame and water jacket –they crack. So now we use stainless steel.



4. Early testing - done without a bubbler. Silly me! A flashback passed through ceramic wadding, bronze wool, and a gas-drier and took out the Mk1. Electrolyser, shown on the right. The bang blew the copper cooling tube clean out of the top and cracked the tank. It put a good dent in the workshop ceiling, too. Clean pants time!

More sophisticated gas-generation gear- and a bubbler was required. Also pressure gauges, much more copper pipe and silicon tube. Total expenditure by this stage was double the $500 raised by the kind folks on ECW, and by now is close to €1500.00. Excluding cigarettes and Aspirin. If anyone wants a refund btw, they only have to ask.

At this stage we were lucky enough to acquire the electrolyser shown below, built by an ECW member. It holds around 6 litres of electrolyte. Also an uprated power-supply to run this beast, a very compact fan-cooled 12V 175A server-farm power unit.



5&6 The second set-up. The sturdy stainless electrolyser with its close-fitting lid is shown, together with the concentric stainless mesh tubular plates. There is space for around 6 litres of electrolyte and 2 litres of evolved Oxy-H gas in the top of the unit- and I am very keen to stop this particular bomb going off.

The lower picture shows the whole assembly- but with 'dry' tanks. Gas-flow is from right to left – electrolyser, bottom of the bubbler, out top to the gas drier, wadding flashback arrestor and finally to the outlet nozzle, inside the mason jar in the tank. This was before we changed to a stainless steel combustion chamber- which brings its own problems. More on that later. Note the spring loaded lid on the bubbler –this is another safety feature.

PROBLEMS, problems! Quite a few, we overcome them 1 by 1. First of all the electrolyser was producing too much OxyH and drawing so much current it got very hot. We reduced the electrolyte concentration (Potassium Carbonate btw) and this solved 2 problems. Except now the slower flow of gas through the nozzle has caused several blowbacks - none got farther than the bubbler of course, but it makes you realise that even at low pressures OxyH is dangerously explosive stuff.

RESULTS SO FAR. …

I'm sorry to tell you that so far we have no worthwhile data that answers the basic question. We managed several data gathering runs using the 'naked flame' with the old mason-jar set-up, but now the required reduction in gas flow means that we cannot produce a matched set of data for catalytic recombination. Why did we reduce the gas flow? Because the electrolyser was threatening to boil-which would mean large volumes of steam coming over with the gas - and possibly screwing the results. Most of it would condense in the bubbler of course- but even so it might well affect the calorimetry results unless we were certain the electrolyser temperatures were exactly equal all the time. Also I am told that water vapour in large quanitities affects the efficiency of the catalyser in a bad way.

Now we have a new problem. The old type of see-through combustion chamber gave a pretty good view of what was going on – but in the steel one there are no 'windows.' Bench testing with the catalyst chunk set up in exactly the position it would occupy inside the combustion chamber shows that there is a tendency for the gas to 're-light' as it escapes from the nozzle. This means you start a run with the catalyst being heated by a stream of gas, and at some point radiated heat from the catalyst causes a flashback to the nozzle and then you have a flame. Sealed inside the combustion chamber, you cannot see of this is the case.

WHAT TO DO NEXT….? I have conceived a whole new way of doing this experiment. The new measuring kit is on order (bang goes the wife's Christmas present) and I will report on the whole procedure when it arrives. I think you will like it though- and the results will be more accessible and almost 'instant'. Watch this space!

FINAL THOUGHTS… a couple of pictures – showing the catalyst being heated by a stream of cool gas – and checking for radiation. There was none, btw. Well, no gamm no x-rays, no betas. Neutron checks to follow. Alan.