

I enjoyed Tom Kramers papers so much, the I decided to write my own. It might help some of the new "cellers" get to stage 3 quickly.

Enjoy,

Bernie

First of all, I would like to thank Joe, Peter Stevens, Alex Schiffers, and Barry Hilton for their pioneering efforts and their generosity to make the information available free to everyone. I also want to thank Bill Williams, for rekindling interest in the cell. Also the BNE guys, who showed me that a cell doesn't have to be very elaborate to run a car. And lastly, much as I hate to say it, to thank Greg Watson, for pushing me to think in different directions.

Now that interest in the cells is once again at a high level and many new people are assembling cells, I've been trying to come up with charging techniques to help all these new cellers get their cells to stage 3, and not have this interest all die off because of frustration.

That being said, I'd like to first do some myth debunking.

1. Stage 3 water is ultra pure. This one is easy - Pure water is an insulator. It is impossible to get current through pure water. What stage 3 water really is in fact, is water with all the anions and cat ions precipitated out. That is all elements with a net charge in solution. The remaining ions are electrically neutral in solution. I'm suggesting that the water used by our Aussie friends is loaded with neutral elements, since they can apparently get 1 amp of current through their cells with only 12 volts.

In other words, I'm suggesting that stage 3 water will have a neutral PH of close to 7. When current is applied the PH of the water in the inner ring will shift to slightly acidic, and the outer ring will shift toward the alkaline. This is once again caused by the fact that the remaining non-neutral elements in the water will still be attracted to the different potentials. I'm not positive of this PH conjecture, but after much reading of other's opinions, and my own experiments, I think this is true.

If I'm not mistaken, electrically neutral water is also good to drink - free radicals and all that.

2. You need a charging vat for serious cell work. Not necessarily true. I think the same ends can be achieved with 2 simple SS plates in a glass container, or even in any cell, for the reasons specified above.

3. You need to have a bottom bolt to introduce the negative into the cell. While this is a proven way to go, it's not really necessary, and adds greatly to the cost and complexity of a cell. Just get the negative connected to the bottom of the center cylinder any way you can. An insulated SS wire or strap is fine. Just run it up next to the container. The same goes for the welded bottom. It's nice, but it complicates things, and it forces the use of the bottom bolt to support the inner cylinders. Without the welded bottom all the cylinders can be supported with spacers. It's probably best to have an SS bottom on the cell but it can simply be held there with whatever means are convenient to the builder. I use PVC end caps and o-rings, which seem to work fine, until the unit is subjected to vacuum. Than you need to back the o-rings up with something like sikaflex or other caulking. To prevent air leaks.

4. Stainless steel that is non-magnetic. This is probably necessary, even for a cell that is not used to charge water. The reason, I think, is because the ferromagnetism causes magnet fields to be built up when current flows through the cell that directly counter the desired magnetic fields. This causes the charged ions to be repelled, when we actually want them to concentrate and precipitate out during the charging process.

5. Short duration charging cycles. This is the key to the whole thing. As I've mentioned above, the charging involves getting rid of all the charged elements. There are 2 very obvious ways to do this. The first would be to start with distilled water and introduce only the desired impurities. Anybody with any chemistry background should be able to look at a chart of the elements and come up with a good guess as to what might work. The second way is to force the undesirable elements to precipitate out of the water. This is the traditional way in the Joe Cell world, whether you use a charging vat, a cell, or some other esoteric means to charge the water.

All this is well and good, but what does it mean in the real world, or just how do you accomplish this. Here is a simple and effective technique that I think will work well. At least it has for me in a couple cells.

First you want to cook the cell. By that I mean simply charge it for a long time. What this does is concentrates the charged ions near the positive or negative (relatively speaking) plates. The ions will then cluster and precipitate out of solution. As far as how long to do this, my best guess is until the water gets hot to the touch. I think boiling the water would be counter-productive because the agitation would probably disperse the clusters.

Once this stage is reached, immediately coarse filter the water into a glass or SS container using something like an old t-shirt. Try to avoid lint.

Now rinse any remaining sludge out of the cell. Tap water should be fine for this. Get as much of this undesirable water out of the cell as you can in a short time by simply inverting it and let it drain for a few minutes/

Now fine filter the water back into the cell. A couple thicknesses of paper towel should work fine. The water in the cell should now be very clear, but it could have some coloration. Not to worry, this is caused by the desirable impurities in the water.

Now just let the water cool to room temperature and try a normal charging cycle. You should see stage 3 bubbles start to form very quickly. If they don't, I think it simply indicates that your starting water was very contaminated and you need to repeat the process to clear it some more.

The closer cylinder spacing of my test/charging cell really does this well. The water becomes a really sludgy mess with a lot of precipitates. After one pass through this process the cell now really produces lots of stage three bubbles.

For cells with the normal 1" spacing on the cylinders, this appears to be a slower process, and several passes will probably be required. I tried one with 2,3,4, and 5" cylinders, and it's producing some stage 3 bubbles after one pass. I think one more cycle through the process will prep the water enough to take it into a good stage 3.

Alex Schiffers was always pushing filtering, and now I think I understand why it helps. If you don't filter after each charging cycle, a lot of the undesired materials simply get re-dissolved back into the water. The idea of "cooking" the water this way is really nothing new, just a way to speed up the process and filter off a lot with each cycle.

I don't think the heat that builds up is a necessary part of this process, so it's possible that by controlling the buildup with an ice pack might allow for an even longer charging cycle, and get larger cells to get the water prepped to stage 3 levels in a single pass. Higher current should speed up the process as well.

I hope some others will try this approach to water preparation and report back on their results. Two cells is a small sample on which to base conclusions.

The concepts mentioned above go a long way toward explaining why my charging/test cell has been such a good tool for water prepping. It always produces a lot of scum, both on top and on the bottom.

My chemistry related comments might be flawed (it's been quite a few years since my last chemistry class) so terminology corrections are welcome.