New concept posted to Facebook Dec. 29, 2022, 9:14 a.m.
https://www.facebook.com/permalink.php?story_fbid=pfbid0oud9QUBimeRV4cj2H1DfwyvPMFm5eqoJEoswZBPrs2N7TKau4F2u75DwU8iHBs2El&id=578136106

Tracy Hall Jr., Shared with Public

Since the Hall Labs "Very Cold Fusion" projected started on May 5, 2022, I've been intensely learning (and relearning) all the related science. Everything we do is open-source and dedicated to the public domain, and I promised to publish developments as fast as they occur. It's been quite a while since I've posted, because I just didn't feel certain about any of my ideas. That changed when I awakened this morning at 6:30, and at last I'm really excited. Here's what I've jotted down so far. (Don't bother trying to decipher my handwriting or understand my gibberish - I promise to soon make it perfectly clear)

(Uploaded this as file "2022-12-29 Project update.pdf" to github.com/hthalljr on Jan 27, 2023)

(1)

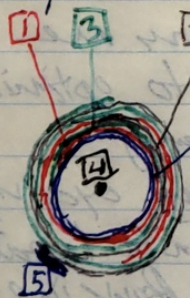
Thurs Dec 29, 2022, 7:50 a.m.
I awakened at 6:30 with the following idea:
Build upon the work of Ali Reza Kamali & coworkers, who have electrolytically reduced hematite to iron with hydrogen at ~~600°C~~ >600°C in molten lithium chloride, by dissolving a small amount of cooper vapor carried in a stream of Argon (RSC Adv., 2020, 10, 36020-36028) Stimulate formation of supraabundant vacancies in Pd by cyclicly oxidizing and reducing a thin coating of Pd on Ni on Cu, cathode & anode being alternated. (Since, per Yuh Fukai & coworkers, supraabundant vacancies can also be created not only in Pd but also in Ni & Cu, this electrode structure covers all 3 possibilities.
Electrodes are copper felt, coated with Ni & Pd, separated by a thin layer of Al_2O_3 felt, wrapped tightly around a porous copper tube and immersed in molten LiCl. A Mo pseudo-reference electrode runs down the axis. Electrode reactions are investigated with cyclic voltammetry to optimize the cycle, both in magnitude and frequency.
In effect, this is a rechargeable battery cycling rapidly. I hope not only to generate heat of high thermodynamic potential for a Rankine-cycle engine, but perhaps even direct excess electricity.

(over)

(continues, 8:07 a.m.)

experimental setup is similar to that of Kaiyu Xie ; Ali Reza Kamali, Green Chem, 2019, 21 198-204, Fig. 1 (p 199)

Instead of a graphite crucible-anode and a hematite (Fe_2O_3) cathode, the crucible ~~in stead of~~ is Al_2O_3 or mullite, and two spirally-wrapped cathode/anode - anode/cathode layers where the Fe_2O_3 cathode was. The metal felt electrodes & Al_2O_3 felt separator should be as thin as possible, to reduce ohmic losses, and as long (multiple layers) as possible, for very large area. One end of electrode (1) extends beyond the separator and is spot-welded to the central porous Cu tube, which is connecto (#1). The other electrode (2) extends beyond the other end of the felt separator and contacts electrode (#2), either by spot welding or by tight wrappings of copper wire. Along the long edge, the Al_2O_3 felt ~~extends~~ is wider than the Cu felt, to prevent shorting.



0 - porous copper inner ~~tube~~ support tube extends above salt melt as ~~electrode~~ + supply

1 - copper felt electrode 1, extending beyond Al_2O_3 felt separator [3] & spot-welded to [0]

3 - Al_2O_3 felt separator

2 - copper felt electrode 2,

4 - Mo rod pseudo-reference electrode

5 - thick copper ~~electrode~~ supply 2, spot-welded to copper felt electrode [2] - extends above salt melt.

Ed Haller Thurs Dec 29, 2022, 8:37 a.m.