Why the H2IL Galvanic Enhanced Electrolyzer (G.E.E.) is NOT rapid oxidation of sacrificial metals to make hydrogen.

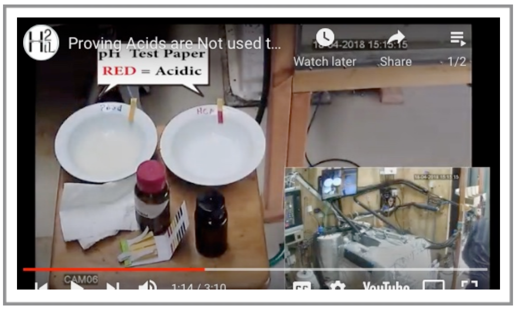
For those who have not performed the school science class experiment, placing certain metals like zinc, magnesium or aluminum foil in a solution of hydrochloric acid or sodium hydroxide, dissolves the metal rapidly and emits hydrogen gas. While this is a rapid temporary release of hydrogen, the metal becomes an expensive sacrifice. It is not a cost effective method of production and will react for a very short time depending on the mass weight of the metal.

Here are a few demonstrated and proven reasons why the H2IL technology is not simple oxidation of sacrificial metals...

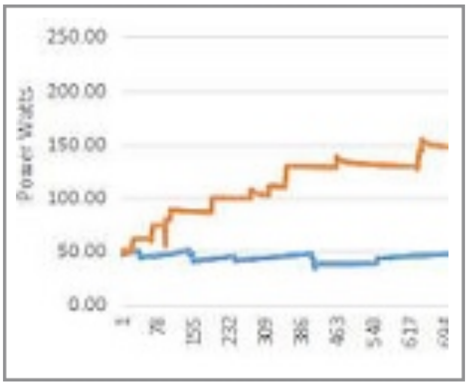
Located at the bottom of the verification page of the website is a link to the larger scale factory installed system. A short video demonstrates that the electrolyte is not acidic or alkaline but rather is pH neutral.

While the system is running a sample is taken from the electrolyte circulation system. pH test strips and magnesium strips are placed into the electrolyte alongside a comparison solution of hydrochloric acid.

The pH strip remains colorless (neutral) and the Mg is untouched. Compared to the rapid consumption of the Mg strip and red pH from the hydrochloric acid.



Electrolyte pH Test on Large Factory Unit



Verification Lab Test: 26/07/19

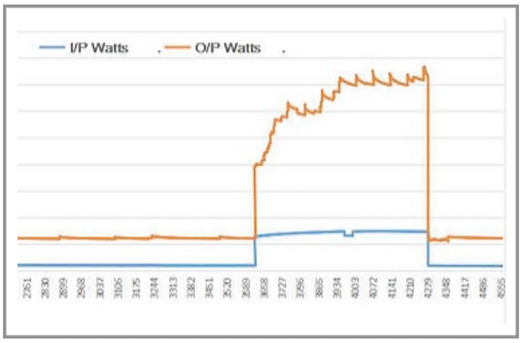
One of the published verification tests graphs the cell startup.

As demonstrated in the accompanying CCTV footage, the cell is not producing hydrogen until power is applied. No solution is added to the sealed, enclosed demonstration cell to trigger a metal consuming reaction.

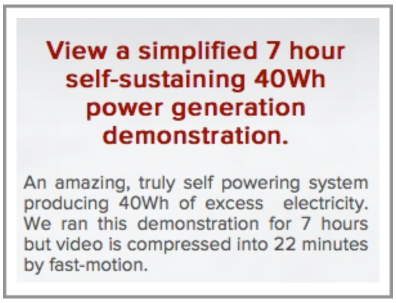
Also the cell starts up gradually with a slow increase of production, unlike the rapid instant reaction from acid or alkaline metal oxidation. On the graph the orange line is the output power and the blue line is the input power. The cell increases in performance and production over a four hour period then maintains a stable performance.

Another test demonstrates the ability of the cell to rapidly respond to changing production demands. A slight increase in the input power causes a rapid response in output. Likewise a drop in input power causes an instant reduction in production. The blue line is the input power graph.

Oxidation of metals with acids is not reliant on applied power and would not respond in this manner. If it was a combination of acid and electricity then the decline in output would be more gradual, unlike the sudden decline followed by flatline stable production as demonstrated in the test.



Verification Lab Test: 17/12/19



The series of tests performed on a 2.4L cell were graphed for a period of up to 7 hours depending on Lab available time slot. The 5L cell ran for 30 hours, both without electrolyte circulation. The generated hydrogen is fed directly into a PEM fuel cell to convert the gas to electricity.

A portion of this electricity is fed back to power the cell and the remainder is used to power floodlights totaling 40W for the 2.4L cell and 120W from the 5L cell. Since the PEM fuel cell is only 40% efficient, 60% of the hydrogen produced is wasted.

Rapid oxidation of metals simply could not produce this level of energy for the little amount of electrolyte (2.4 Liters and 5 liters). Nor could it produce this amount of constant, stable hydrogen for more than 30 minutes before a rapid decline in production. Given the small size of the cell, the galvanic metal mass is very small and would not have lasted for more than one hour before totally sacrificed or acid dilution.

H2 Innovation Lab (H2IL)