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Report of Visit to BlackLight Power on January 14 and 15, 2014

During my January, 2014 visit to BLP, I observed various experiments which were aimed at showing excess energy (or power) from the so-called SF CIHT technology.

The first demonstration consisted of a spot welder in the atmosphere igniting a closed Al cup containing Cu, CuO, and water with explosive intensity. It would appear that if the power produced in the explosive reaction could be captured, this would be a significant breakthrough. In order to attempt to quantify the assumed excess energy, a number of calorimetry experiments were carried out which will be described next.

Two different experiments were carried out in a PARR calorimeter with spot welder ignition of the fuel which was the same as in the spot welder experiments. In the first experiment the observed temperature rise was 0.105 C with input energy of 674 J and output energy of 1253 J. Thus, output/input = 1.86 with 86% excess energy. From the voltage and current waveforms, the ignition occurred at about 125 J input such that the gain, output energy relative to the energy to initiate, was about ((1253-674)/125) 4.6 times the ignition energy. The second, nominally identical, experiment resulted in a temperature rise of 0.094 C with an input energy of 891 J and an output energy of 1329 J. In this case output/input = 1.49 with 49% excess energy. From the voltage and current waveforms, the ignition occurred at about 179 J input such that the gain, output energy relative to the energy to initiate, was about ((1329-891)/180) 2.4 times the ignition energy. In order to improve the sensitivity (and reproducibility), I recommend that the mass of the unit be reduced which would reduce the effective heat capacity and result in a larger temperature rise. This may be nontrivial but is clearly doable.

Next, water arc calorimetry was carried out in 13 separate experiments with pure water at nonreactive copper electrodes initiated by a voltage pulse of ~2700 V in each case. It was found that the average output/input energy was 1.69 with a standard deviation of 0.13 in this work.

Finally, differential scanning calorimetry was carried out using 4.6 mg of copper dihydroxide and 11.1 mg of ferrous dibromide in a gold crucible. Here the theoretical energy for the most favorable chemical reactions is -62.6 J/g, whereas the measured energy output was -197.6 J/g. In this case measured/theoretical = 3.16.

To summarize, in all cases excess energy was produced, ranging from 49% to 216%. I recommend that additional work be done to tighten this range, but most of all I recommend that a prototype device be

constructed to prove that power can be extracted from this new solid fuel and that this prototype be a reliable and scalable means of electricity generation. Remember that the proof of the pudding is in the eating.

I gratefully acknowledge John Lotoski, James Trevey, and Jiliang He who carried out the experiments during my visit. They were completely open with me and seemed quite competent.

Respectfully submitted,

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