

A frugal experiment on potential cooling effect of potable water irradiated with laser pen

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Abstract

In previous article, we reported initial findings based on small experiment on potential use of salt-water as cheap source of renewable battery with various kind of metals as anode and cathode. The purpose of these experiments is to find out which combination of anode and cathode is capable to generate the best performance in terms of electric voltage. Following that previous reports, we tried to conduct further simple experiments on possible effect of low intensity laser irradiation on potable water's electrical features. Nonetheless, this report is slightly disappointing, because as an effect, there is no increase of water electrical feature, instead it may support initial reports by others such as Cohen Tannoudji, Alain Aspect et al, on laser cooling effect to molecules [3][4].

Introduction

The effective use of electricity from renewable sources requires large-scale stationary electrical energy storage (EES) systems with rechargeable high-energy-density, cheap batteries. While batteries using lithium, cadmium, lead-acid etc. have been widely used, there is an alternative source i.e. salt-water which is quite abundant in nature and known as electrolyte. Therefore, following previous articles [1][2], this writer conduct small experiments to see possible effect of small intensity laser irradiation on electrical features of potable water.

Procedures

This writer conducted small experiments with small intensity laser pen (to irradiate), and a glass of potable water. To add a little flavor to this small experiment, we also conduct low intensity laser irradiation to a small portion of non-alcoholic beer. As Russel Crowe says in *A beautiful mind*, "I had respect of beer."

Apparatus

This writer uses simple tools, like multipurpose voltmeter, low intensity laser pen, and potable water. They are as shown below.

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Illustration 1.



Illustration 2.

Calibration test

Before this writer begins the test, this is reading of voltmeter (on air), it shows 0.00 milli Volt.



Illustration 3

Results

Results of our small experiments are as shown in Table 1 below:

| Test. No | Condition | Low intensity irradiation with laser pen | Registered Voltage (milli V) | Scale of reading |
|----------|---|--|------------------------------|------------------------|
| 1 | Potable water | No | 4.50 | (200 milli Volt scale) |
| 2 | Water irradiated with laser pen | (59 seconds) | 3.40 | (200 milli Volt scale) |
| 3 | Water irradiated with laser pen | (180 seconds) | 2.70 | (200 milli Volt scale) |
| 4 | Salt-Water | No | 2.40 | (200 milli Volt scale) |
| 5 | Salt-Water irradiated with laser pen | (59 seconds) | 0.50 | (200 milli Volt scale) |
| 6 | Beer (non-alcoholic) | No | 12.60 | (200 milli Volt scale) |
| 7 | Beer irradiated with laser pen (59 seconds) | (59 seconds) | 12.10 | (200 milli Volt scale) |



Illustration 4. Potable water irradiated with laser pen (horizontal irradiation). Note the reading at Voltmeter reads 2.7 milli Volt .

Discussion

What we can report in the above table is based on small experiments at 7th Dec. 2022. The followings are additional findings:

- The measurements are actually varying, but we read the number registered at Voltmeter around 60 seconds after initial reading.
- It is found that the effect of laser irradiation on potable water and saltwater although quite small, suggests that low intensity irradiation tends to reduce the voltage reading of the system. (The irradiation of laser pen were conducted horizontally through the glass wall).
- The reduction of reading on voltmeter can be interpreted as the system of potable water and salt-water seems to undergo effect known as laser cooling of water molecules. We refer to publication of Ketterlee and Alain Aspect etc.
- As additional finding, on non-alcoholic beer system, registered reading on voltmeter seems higher in significant way , around 12.6 mili Volt, and slightly reduced after low intensity laser irradiation.
- This may suggest that molecular composition of such a non-alcoholic beer can increase voltage, instead of just salt-water system. This may be worthy for further experiments on possible material of small cost electric storage.

Concluding remark

While initially we tried to find improvement of salt-water battery performance, nonetheless, this report is slightly disappointing, because as an effect, there is no increase of water electrical feature, instead it may support initial reports by others such as Ketterle, Alain Aspect etc, on laser cooling effect to molecules. All in all, this small experiment can be perceived as a step for lab scale verification of laser cooling effect of water molecules, which may be useful for other purposes, such as low temperature physics experiments.

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Appendix I. Extended experiment on laser irradiated potable water

(12th Dec. 2022)

While the first series of our experiment clearly indicated possible laser cooling effect of low intensity laser irradiation of potable water and salt water, the following extended experiment on low intensity laser irradiation shows a rather mixed result. Initially, laser irradiation with laser pen gave lower electric potential (down to several minus milli Volt to the Voltmeter reading), but later on after more than 180 sec of irradiation, it shows increased positive milli Volt of electric potential of the system.

Results: Results of our small experiments are as shown in Table 2 below:

| Test. No | Condition | Low intensity irradiation with laser pen | Registered Voltage (milli V) | Scale of reading |
|----------|---------------------------------|--|------------------------------|------------------------|
| 1 | No medium (calibrated test) | No | 0.00 | (200 milli Volt scale) |
| 2 | Potable water | No | 2.20 | (200 milli Volt scale) |
| 3 | Water irradiated with laser pen | (59 seconds) | 6.10 | (200 milli Volt scale) |
| 4 | Water irradiated with laser pen | (180 seconds) | - 7.70 | (200 milli Volt scale) |
| 5 | Water irradiated with laser pen | (270 seconds) | +0.80 | (200 milli Volt scale) |
| 6 | Water irradiated with laser pen | (450 seconds) | 9.70 | (200 milli Volt scale) |
| 7 | Water irradiated with laser pen | (600 seconds) | 10.1 | (200 milli Volt scale) |

The above extended experiments seem to indicate that there is slight hope that laser irradiation procedures of water or salt water can be expected to increased electric potential of salt water battery.

Concluding, there seems to be discrepancy between this experiment of low intensity laser irradiation of water molecules with theory of laser cooling. More experiments can be expected.

(12th Dec. 2022)

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Appendix II. Our previous book chapter published by Springer (2022)

Our chapter at Springer's book: "Efficient Use of Valuable Resources - Knowledge and Cultural Resources" has been released.

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edited by Larisa Ivascu, Lucian-Ionel Cioca and Florin Gheorghe Filip.

Online volume link: <https://link.springer.com/book/10.1007/978-3-031-09928-1>

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