

Formation of O₂ and CO₂ reduction without Sunlight using Weak Energy of Water with pico-sized Particle

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Received: January 12, 2022; **Published:** January 28, 2022

Abstract

They have researched photosynthesis for approx. 250 years. They found the structure of chlorophyll in the 20th century, and photosynthesis has been elucidated as the total system by the Calvin cycle. Hereafter, they discussed the electron transfer in the chlorophyll. Since COP21, carbon-neutral has rapidly been a topic to decrease CO₂, and they study even artificial photosynthesis repeatedly. Their researches are solar beam, CO₂, and H₂O involving plants. The discussion has not developed from there up to today. The chlorophyll receives sunlight leading to an electron transfer, when the manganese cluster dissociates H₂O, then makes ATP. The enzyme catches CO₂ and forms glucose. This system is the well-known Calvin-Benson cycle. Here is a point that we report, namely, non-sunlight. We may dissociate the hydrogen bonds of water and assume to form the pico-sized particles that help plants absorb water from their roots, and they are easy to get around in stems and leaves, resulting in reaction with CO₂. The particles can emit far-infrared and terahertz under no sunlight, where we propose the agriculture factory with sustainable energy sources.

Keywords: O₂ formation; CO₂ reduction; no-sunlight; pico-sized particle; LED light

Introduction

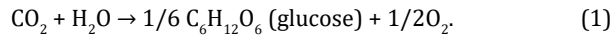
Plants have been a senior of humanity since the Birth of The Earth because we have not performed photosynthesis yet. J. Priestley (England) discovered oxygen in 1774, and C. Barnes (U.S.A.) employed the word of photosynthesis first, the late 1800s. In the 20th century, R. M. Willstatter determined the structure of chlorophyll. Since then, the Calvin Besson cycle has been famous for the making process of starch from CO₂. In the 1950s, L. Marcus progressed the electron transfer theory (photosynthetic electron transfer system is formally called). Thus, photosynthesis research has a long history of almost 250 years.

On the other hand, they have progressed the research from the electronic couplings such as the Menna-Matthews-Olson photosynthetic light-harvesting protein [1] and light-capturing antenna pigments to the reaction center [2]. We report photosynthesis in a broad sense here. Photosynthesis, what I mean, is the process with no sunlight. Therefore, we regard the existence of hydrogen in the meaning of <H⁺~e⁻>, and we call it infoton after hydrogen bond dissociation of water [3]. Hereafter, we name it SIGN water (Spin Information Gauge Network) [4]. The elementary like-particle infoton in SIGN water functions in the various fields, and we propose the agriculture farm applying SIGN water technology.

Results and Discussion

Chemical reactions for photosynthesis

Here is a traditional chemical reaction of photosynthesis as follows;



When R. Emerson exposed a plant to a light wavelength of more than 680 nm (700-720 nm), a specific rate of photosynthesis was observed [5]. Since then, the research of chlorophyll and pigment in plants has been progressed, such as long-wavelength (PS1 and PS2). The light excites the chlorophyll molecules at the reaction center and causes an increase in energy.

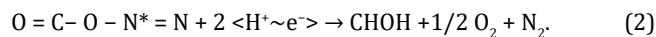
Recently, they have researched many reports from the viewpoint of energy harvest of solar energy [6, 7]. People utilize sunlight from 400 nm to 700 nm.

Those photosynthesis researches have focused on sunlight, although recent studies are familiar with CO₂ reduction [8, 9].

Here we look at the water for photosynthesis, but not sunlight which is a region of electromagnetic waves such as far-infrared and terahertz. It may not be a different definition of standard photosynthesis. We must notice water more. For instance, plants and animals have a particular protein called aquaporin, which passes only water [10, 11] and the narrowest part is 0.8 nm, so usual water is difficult for going through quickly. That is why a plant may possess aquaporin three times more than a human being.

Firstly, it is a chemical reduction of CO₂ with water. The reverse reaction is breathing. Human beings inhaled the fresh air and expired CO₂. When we look at water microscopically, the dashed line can be a hydrogen bond (3.9 eV) in the formula, H---O—H.

The nitrogen activated with SIGN water, and we define it in the formula, - N* = N (bond energy, 4.2eV), which can attack the hydrogen bond,



Incidentally, C-H's bond strength is 4.3 eV, so - N* = N helps the infoton for this reaction, and nitrogen goes away, resulting in N₂.

Nitrogen activation works chemical reduction by SIGN water in various fields [14].

Car engine performs "photosynthesis."

Hydrocarbons (HC) in the engine room usually burn with air (oxidation);

C₃H₈ → C_n H_m, CO₂, CO, NO_x, H₂O, and non-combustion HC are generated and are exhaust fumes into the atmosphere through the ventilation pipe of the automobile.

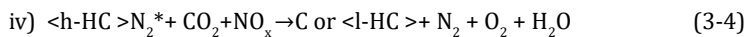
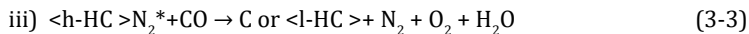
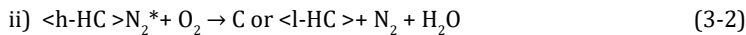
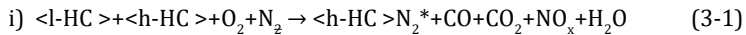
In our system, activated nitrogen, N₂*, may form N₂*H instead of NO_x, and then HC can be burned more. In other words, it suggested that chemical reactions in the engine room give rise to reduction besides oxidation. Table 1 shows the remarkable results of reduction instead of oxidation resulting in the formation of oxygen. We also reported this kind of experience for usual cars [12].

	CO ₂ (%)	O ₂ (%)	CO (%)	HC (ppm)	NO _x (ppm)
normal	4.9	14.9	0.20	51.9	22.8
CPP	4.5	15.0	0.14	52.0	21.8
activated CPP	3.6	16.8	0.08	19.2	13.6
change (%)	-26.5	12.8	-6.0	-63.0	-40.3

Table 1: Results of test with CPP device in a tractor. CPP: Copper-plated plastic (Figure 1).

We may estimate the following mechanisms in an engine room and exhaust gases,

<h-HC >; higher hydrocarbon than C₃. <l-HC >; C = 1 or 2 and <h-HC >N₂*; active N₂* hydrocarbon.



In this experiment, the control and the active were set in two separate tents and idled for one hour while we measured the exhaust gases through a ventilation pipe in real-time. After one hour, we poked our face into the tents of the car, putting the activated CPP device; our glasses steamed up. It was very touch to do the same in the tent of the control car because of the foul smell of the exhausted gases. We found other characteristics in the container filling water from the gases, where nitric acid in the control car instead of nitrogen gas in the active vehicle. We also satisfied the result of the chemical reactions above.

As another evidence, we measured VOC from the automobile after setting of copper-plating plastic device. VOC increased in the first four hours of driving because the adhered soot, microparticles, and other organic compounds detached first with the atmosphere from the engine due to the device, following the reduction of VOC (Figure 1). The gases were reduced after burning of gasoline in the machine the same as in the previous experiment (Table 1).

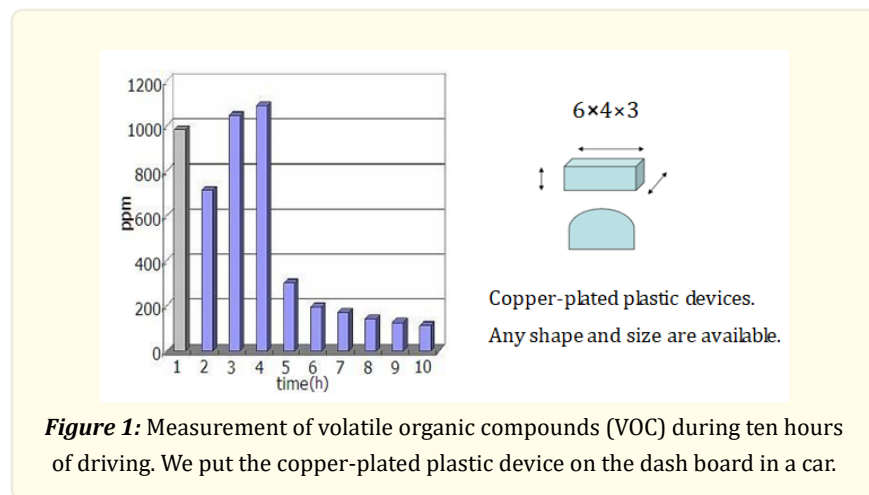


Figure 1: Measurement of volatile organic compounds (VOC) during ten hours of driving. We put the copper-plated plastic device on the dash board in a car.

“Photosynthesis” in refrigerator

CO₂ reduction

One refrigerator is activated, which may have information of infoton, and the other one is a control. The two poly bags contain CO₂. We put one bag into the activated, and the other one was in the control refrigerator for three days. Tokyo public facility measured them with the infrared spectrometer (JIS K 0101 25.2), and the results are as follows;

Activated refrigerator: 1,330 mg/L and control: 1,620 mg/L.

Activated refrigerator reduced approximately 17.9%, CO₂ reduction.

Furthermore, a refrigerator is the same, but the polyethylene bag is different; one is an activated bag, and the other one is a control one. We measured CO₂ for every two bags (Table 2).

Active bag 1	940 mg/l
Active bag 2	955
Control 1	1,460
Control 2	1,330

Table 2: CO₂ reduction test in the polyethylene bags for 2 hours keep in the refrigerator.

Spinaches

We confirmed new roots of spinaches besides keeping them fresh in a refrigerator for more than a week. We reported the other evidence of reduction for the mushrooms in the activated polyethylene bag in the room, where we found oxygen generation without CO₂ [15].



Figure 2: Spinaches are in a refrigerator. Left; non-activated polybag, and right; an activated bag for one-week keeping. The control sample shows the color change of brown. Activated spinaches indicate the generation of some roots besides keeping the leaves fresh.

Sugar content of strawberries in a dark box

We put the box of strawberries and the SUS device (we named it a generator) in a cardboard box for five hours, as shown in Figure 3. There is another box of strawberries with no device of control. After that, we measured the HbA1c of the strawberries that increased 9.0~10.0 up to 12.0~13.0.

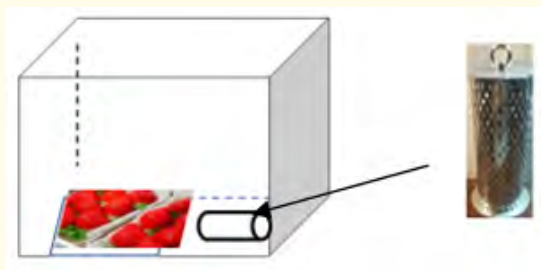
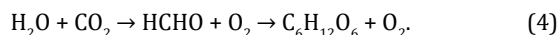


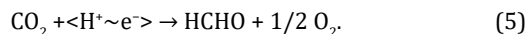
Figure 3: Dark box to keep strawberries with the device (generator) depicted right.

The information of infoton, $\langle H^+ \sim e^- \rangle$ transfer(s) from the polybag as the atmosphere of far-infrared and terahertz electromagnetic waves, and the lone pair electron of a nitrogen atom in the box activates with the waves, in describing as N₂* previously. The spinaches result in higher sugar content. We found noticeable differences in the onions in the dark boxes. The root-growths of onions were com-

pared in the boxes for two weeks without any lights [14]. Those are the exact mechanisms as equation (1).



Consideration infoton,



Electrical conductivity

Electrical conductivity is evidence to indicate the activation of an electron in any substance. There are no remarkable differences between tap water and SIGN water (its origin is the same tap water) from the place and season. Water can generally be said a semiconductor. That is why we get an electrical shock when we touch metal in the winter dry season. As shown in Table 2, SIGN water is the same conductor among them due to infoton, $\langle \text{H}^+ \sim \text{e}^- \rangle$.

	<i>pH</i>	<i>Voltage (V)</i>	<i>Conductivity (S/m)</i>	<i>Temperature (°C)</i>
SIGN water	8.1	392	82×10^{-6}	22.1
Valley water	8.1	355	175×10^{-6}	21.3
Tap water	8.4	162	225×10^{-6}	22.4

Table 3: Electrical conductivity of water.

Infoton, $\langle \text{H}^+ \sim \text{e}^- \rangle$ is different from proton-coupled electron transfer (PCE theory) [16, 17], where the following chemical reactions are defined;

Electron transfer; $[\text{HX}] + [\text{M}] \rightarrow [\text{HX}]^+ + [\text{M}]^-$, Proton transfer; $[\text{HX}] + [\text{M}] \rightarrow [\text{X}]^- + [\text{HM}]^+$ and Coupled proton electron transfer; $[\text{HX}] + [\text{M}] \rightarrow [\text{X}] + [\text{HM}]$.

Photosynthesis I and II (PSI & PSII) are reaction centers that capture light energy to perform it with the cytochrome b₆f complex. This complex receives electrons from PSII and passes them to PSI [18, 19].

The noticeable difference in SIGN water from the PCE theory is the physical reaction between the infoton and nucleus of any atoms. We found the changes from the contaminated soil with radio nuclides to stable bit of barium in Fukushima 2011 through 2013 [4, 20].

Furthermore, specific kinds of information from infoton may transfer to other substances to change, and we can confirm the meaning changed by immersing it into tap water. We analyzed the water in terms of relaxation time ($T_2 = 1/\pi\Delta\nu$) from full width-half maximum ($\Delta\nu$), and free induction decay of spectra with H-NMR.

We will elucidate what the information will be in the near future.

In the next section, we discuss the information transfer for which substances can change with infoton.

What kind of substance can be changed by infoton

We indicate the following photos so that people can imagine what kind of material will be able to get the information from SIGN water, immediately;

We should say any materials, a metal, ceramics, plastic, glass, timber, plant and animal even the atmosphere (N₂ and O₂). It is difficult to identify what changes in the material, namely, electron, nucleus, or field by the visualization. We can notice that the growth of

plants, CO₂ reduction, O₂ formation, strength of concrete, deodorizing in a room, anti-rust, reducing radioactivity, etc. after treatment by SIGN water.

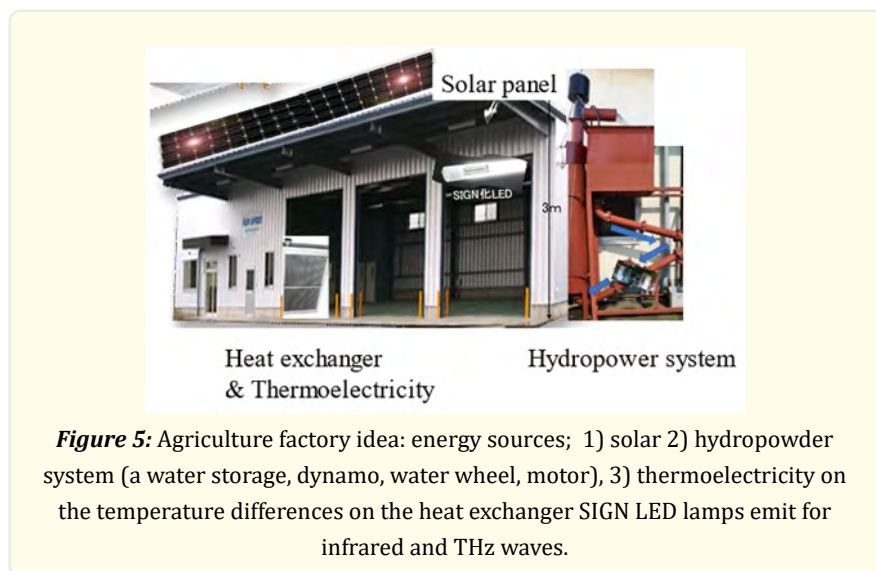


Figure 4: Various materials transfer the information from SIGN water (infoton's momentum).

At present, we should regard momentum, which contains mass, velocity, and spin of an electron, nucleus, or atom itself, namely, $p = \psi (m, v, \sigma)$. We don't know what kind of function ψ is yet.

Proposal for universal agriculture

A human being has faced global warming like climate change, heavy rain, flood, and ice melting in both polar, which are a threat to humanity. We have to study the desalting of seawater, drinking water for livestock, and agriculture factories with SIGN water and SIGN LED, as shown in Figure 5.



In the factory, they fabricate the crops at night, even in the bad weather. Furthermore, we can directly get sunlight by inclining the solar panel when we want.

Conclusion

We summarize that our definition of photosynthesis is the formation of O₂, the CO₂ reduction, increasing glucose or sugar content utilizing SIGN water without sunlight and activated materials with it. Furthermore, nitrogen in the air also can activate. Finally, we proposed the

ubiquitous agriculture factory where we can apply SIGN water.

Acknowledgement

We thank Messrs. T. Amano of General Incorporated Association Green Earth Again in Yokohama and K. Bojo of GIANO in Tokyo for discussing with agriculture factory. And we also express thankfulness to Dr. Y. Araki of the Agriculture Forum for the Next Generation in Tokyo.

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Volume 2 Issue 2 February 2022

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