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# Analysis of the Electron Phenomena inside the Water Molecule Power Reactor System

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-----***ABSTRACT***-----
*In the design of the Water Molecule Power Reactor there are many parameters and elements to be considered such as thephysical design structure and the analysis of mathematical elements and principles which is essential and needed in order to be able to create a safe and fully working Water Molecule Power Reactor.*
*In this paper it will examine the molecular level of these design principles and the mathematical theories beyond the concept of the design parameters.*
*There are many questions which need to be answered which. is why it will be reflected in this paper and to answer those questions this paper will focus on the molecular properties of matter with respect to electrons and atoms. This paper will address one by one and tackle these mathematical problems and answer them in a way that is simple and straight forward for the readers to be able to understand. The following questions will be answered in this paper such as the unit conversion of one liter to one kilogram, what is the atomic weight of hydrogen and oxygen atom, what is the mass weight of one molecule of water, the atomic properties of hydrogen and oxygen atoms, the relationship of coulombs to ampere, how many electrons are there in one molecule of water, the ratio of electrons in terms of molecular weight and voltage and the last part is the explanation of the rate of change with respect to time.*
***Key Words: Hydrogen, Oxygen, Water, Reactor, Electrolysis***
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## I. INTRODUCTION:

The basic structural design and mathematical principles of a Water Molecule Power Reactor will be illustrated and examined in this paper. All the mathematical principles and inner working theories which constitute the overall design concept of the Water Molecule Power Reactor will be explained in a simple way. This mathematical and physical concept is vital to the overall efficiency and reliability of the proposed design, which is why in this paper it will discuss these fundamental mathematical principles one by one at a time so that it can layout the foundation of the state of the art Water Molecule Power Reactor.

Again not all principles of mathematics and physics will be discussed on this paper only those which are relevant at the moment in time. This research constitutes many development stages and each stage brings forth new ideas and new discoveries. Although this research have now reached the second level of its design concepts there are still many ideas which still needs considerable detailed and well explained data tabulations and some will be covered in this paper, but not all, only those which are relevant at this time.

And so, to begin the discussion with the first topics as shown below,

### 1. Unit Conversion Principles

The first topic of great interest is the discussion in the very basic and the most fundamental, in any scientific undertaking which is the unit conversion of entities such as the question of how many kilograms are there in one liter of water. Water is a very essential component of this research so that it will be mentioned more often in this paper, thus it says that one liter of water is equal to one kilogram of mass in numerical and mathematical form we have, according to University Physics [1], (Young, Freedman, 2016),

1000 milliliter of pure water = 1000 grams of pure H2O gas; (1.0)
1000 mL of H2O (liquid) = 1000 g of H2O (gas); (1.1)
1000 mL = 1 Liter; (1.2)
1 Liter of H2O (liquid) = 1 kg of H2O (gas); (1.3)

Thus it has now been shown that the relationship of one liter of liquid water and that of one kilogram of hydrogen and oxygen gas combined is as shown.
1 Liter of $H2O$ (liquid) = 1 kg of $H2O$ (gas); (1.3a)
One liter of pure water molecule is the standard of measure of this research, so that it would be easy to quantity future applications with one liter of pure water as a reference base. This standard of measure would become the proposed standard quantitative value for any future technical studies in a large industrial scale development of the Water Molecule Power Reactor.

**2. Atomic Weight of Hydrogen and Oxygen Atoms**

At this point in time it would be prudent to know the atomic weight of the hydrogen and oxygen atoms which are inside the molecule of water.
Thus to say, according to College Chemistry [3], (King, Caldwell, Williams, 1977),
1 mole of water is equal to18.01528 grams/mol (2.0)

1 mole of water = 2 grams (for 2 moles of H atoms) + 16 grams (for 1 mole of O atom) = 18 grams/mole in total; (2.1)

The atomic weight of the hydrogen and oxygen atoms is important on this study for it would determine the relative weight of the hydrogen and oxygen gas produced in the Water Molecule Power Reactor.
Based on this papers scientific conclusion one liter of pure water would produce one kilogram of pure hydrogen and oxygen gas.
And now to move along with the discussion this paper, will examine another subject of great interest as follows.

**3. Mass Weight of One Molecule of Water**

In the above and previous statements, it was able to determine and illustrate; the individual and combined atomic weight of the hydrogen and oxygen atom. And now this paper would need to determine the mass weight of one molecule of water, this value will be essential on the later computation of the quantity of electrons per one molecule of water.
Thus to begin with, this paper will use some of the following formula in physics, which is as follows, according to University Physics [1], (Young, Freedman, 2016),
$M = NA\ m;$ (3.0)
Where;

M = molar mass, atomic weight, molecular weight;
$NA = 6.0221367(36) \times 10^{23}$ molecules/mole (Avogadro's number);
m(H2O)= mass of a single molecule of water;

Now if M = 18 grams/mole then, (3.1)

$M = NAm\ (H2O)\ ;$ (3.2)
18 grams/mole = [$6.0221367(36) \times 10^{23}$ molecules]/mole *m (H2O);*
*m(H2O)*= (18 grams/mole)/[ $6.0221367(36) \times 10^{23}$ molecules/mole];
*m(H2O)*= $2.988972 \times 10^{-23}$ grams/molecule of H2O; (3.3)

The above computed values and quantities is the value of the mass weight of one molecule of water which is composed of two atoms of hydrogen and one atom of oxygen and their combine molecular weight is *m(H2O)*= $2.988972 \times 10^{-23}$ grams/molecule of H2O.
And now moving along with the discussion the next quantity to be examined is as follows,

**4. Atomic Properties of Hydrogen and Oxygen Atoms**

A very important part of the design parameters, is the atomic properties of hydrogen and oxygen as being the prime source of energy originating from the water molecule. In this paper, it will try to gather all relevant technical data on hydrogen and oxygen as being the principal elements in the Water Molecule Power Reactor. Therefore it is very essential that this paper illustrate every detail that concerns the hydrogen and oxygen atoms so that it will become the ultimate guide as this writing endeavor in creating the energy of the future through the development of the Water Molecule Power Reactor. And so the following table illustrates these quantities as shown.

**Table 1:** Atomic Properties of Hydrogen and Oxygen Atom

| Element Symbol | Atomic Number ($e^-$) | Atomic Mass | Electro Negativity | Density | Melting Point | Boiling Point |
|---|---|---|---|---|---|---|
| **O** | 8 | 15.999 $g.mol^{-1}$ | 3.5 | 1.429 $kg/m^3$ at 20˚C | -219 ˚C | -183 ˚C |
| **H** | 1 | 1.007825 $g.mol^{-1}$ | 2.1 | 0.0899 $x10^{-3}$ $g.cm^{-3}$ at 20˚C | -259 ˚C | -252.8 ˚C |

The above Table 1, describes, that the Atomic Number is also the number of electrons in a given atom, this guidance is important as the discussion of the properties of the molecule of water moves along. Also the atomic mass number indicates the mass weight of a given atom per mole.

And now to discuss these principles it can be shown that, the molecular weight of water when the water is one liter it shows as follows,

One liter of water is the proposed standard of measure of this miniature scale study and it will also be used as the basic standard in the industrial scale application of the proposed design of the Water Molecule Power Reactor.

And so to begin with, again from the formula in University Physics, (Young, Freedman, 2016),

$M = NA\, m;$ (4.0)

Where;

M = molar mass, atomic weight, molecular weight;

$NA = 6.0221367(36)x10^{23}$ molecules/mole (Avogadro's number);

m(H2O)= mass of a single molecule of water;

At this point in time the value of m (H2O)= 1000 grams, where in,

$M = NA\, m;$ (4.1)

$M = [6.0221367(36)\ x10^{23}$ molecules] / [(1000 grams) / (18 grams/mole)];

$M = 3.346x10^{25}$ molecules of atoms in one liter of water; (4.2)

And so therefore the molar mass of one liter of water is $M = 3.346x10^{25}$ molecules of atoms in one liter of water, according to chemistry this quantity should be multiplied by how many atoms each one molecule of matter is composed of, and in this case water is composed of three atoms per one molecule of water, which is two hydrogen atom and one atom of oxygen.

And so from the above value of M, it is said that this value of M must be multiplied by a quantity value of three and so,

$M = 3.346x10^{25}$ molecules of atoms in one liter of water; (4.2a)

M (H2O) = M x (No. of Atoms in one molecule of Water);

M (H2O) = $[3.346x10^{25}$ molecules of atoms] x [3 atoms per one molecule]; (4.3)

M (H2O) = $1.0038x10^{26}$ molecules of atoms in one liter of water with three atoms per one molecule of water. (4.4)

Now to specify the conversion of 1000 grams of H2O to moles we have the following equations.

(1000 grams of H2O) x (1 mole of H2O/18 grams of h2O) = 55.556 moles of H2O; (4.5)

At this point the quantitative volume of molecules of all atoms in one liter of water, have now been identified and was computed completely as shown above in the quantity figure of M (H2O) = $1.0038x10^{26}$ molecules of atoms in one liter of pure water.

The quantity of atoms per one liter of pure water is very important on the computation on the rate of change with respect to time wherein this paper is able to calculate on how much water will be consumed in the electrolysis process and in what specific period of time will it be totally depleted, this paper will discuss this later as the discussion moves along as follows.

**5. Relationship of Ampere, Coulombs and Seconds.**

Ampere is directly proportional to the coulombs and inversely proportional to time or seconds and in mathematical form we have as follows, according to University Physics [1], (Young, Freedman, 2016),

1 A = 1 C / 1 T (second); (5.0)

Where:

A = amperes;
C = coulombs;
T = time (seconds);

Also ampere is the unit value of current and current is a quantity of flow of electricity into a given medium. From the Ohm's Law we have,

I = V / R; (5.1)

Where:
I = current, amperes (A);
V = voltage, volts (V);
R = resistance, ohms (Ω);

And now this paper will try to compute on how many electrons are there in one volt of energy.
From University Physics, (Young, Freedman, 2016), it can be shown to have the following value,
1 coulomb = $6.25\text{x}10^{18}$ electrons; (5.2)

Therefore this paper can say that in one coulomb of charge there is a corresponding quantity of electrons which is $6.25\text{x}10^{18}$ electrons. Wow this is an amazing number. This paper was able to quantity the number of electrons in a charge. Thus,
1 coulomb = $6.25\text{x}10^{18}$ electrons present; (5.2a)
Therefore we can also say that,
$1.6\text{x}10^{-19}$ coulomb = 1 electron ($e^-$); (5.3)
The above value, clearly illustrates the significant quantity of electrons that is present in one single charge of coulomb.
This quantity is very important in this paper's desire to be able to calculate the quantity of electrons that is present in one volt of electrical energy. By understanding the quantitative figure of electrons this paper can compare the quantity of atoms to that of the quantity of electrons. In this way this paper is able to compute the rate of change with respect to time.
From the previous research undertaken prior to this writing it was written and identified that the value of resistance to the water molecule was as follows.

**Table 2:** Electrical Properties of the Water Molecule Reactor (800 mL)

| Type of Reactor Rods | Number of Rods in the Anode (+) | Number of Rods in the Cathode (-) | Total Resistance of the Reactor (800mL H2O) | Total Current Requirement of the Reactor | Total Voltage Requirement of the Reactor | Power Requirement of the Reactor |
|---|---|---|---|---|---|---|
| **Stainless Steel** | 4 Rods | 4 Rods | 40 ohms | 0.3 Amperes | 12 Volts DC | 3.6 Watts |

Assuming that the value of resistance would increase in reference to the table above Table 2, then if the quantity of water increases to 1000 ml from its previous quantity of 800 ml then the resistance would also increase from 40 ohms to 50 ohms, in the above table every 200 ml increase of water quantity would also increase the resistance by 10 ohms.

For this reason from 40 ohms it was scientifically assumed that it will increase to 50 ohms if a quantity of additional 200 ml of water is added into the Water Molecule Power Reactor.

**Table 3:** Electrical Properties of the Water Molecule Reactor (1000 mL)

| Type of Reactor Rods | Number of Rods in the Anode (+) | Number of Rods in the Cathode (-) | Total Resistance of the Reactor (1000mL H2O) | Total Current Requirement of the Reactor | Total Voltage Requirement of the Reactor | Power Requirement of the Reactor |
|---|---|---|---|---|---|---|
| **Stainless Steel** | 4 Rods | 4 Rods | 50 ohms | 0.24 Amperes | 12 Volts DC | 2.88 Watts |

The table above which is Table 3, now reflects the new value of resistance with respect to a 1000 ml of water quantity added, and is now present inside the proposed Water Molecule Power Reactor.
Based on Table 3, the value of current inside the Water Molecule Power Reactor is now equal to 0.24 amperes. Therefore in mathematical form it can be shown that,
I = 0.24 Amperes, at 1000 mL of pure
H2O molecule; (5.4)
From,

1 A = 1 C / 1 T (second); (5.5)

Therefore if the current value is equal to 0.24 A, then this computation can be shown as follows, according to University Physics, (Young, Freedman, 2016),

1 coulomb = $6.25x10^{18}$ electrons; (5.5a)

And,

I (current) = 0.24 A; (5.6)

Then this paper shall convert this value of current to the corresponding number of electrons in a given current quantity; this paper shall use the following conversion process,
I (amperes) = I (given current, A) x ($6.25x10^{18}$ electrons/ 1A);
= (0.24A) x ($6.25x10^{18}$ electrons/ 1A);
I (amperes) = $1.5x10^{18}$ electrons / per second; (5.7)
Therefore the value which is I = $1.5x10^{18}$ electrons / per second, is the quantity of electrons that will travel to a 50 ohms medium in every second.
From,

I = V / R; (5.8)
V = I R; (5.9)

Then,

V = IR;
V = ($1.5x10^{18}$ electrons / s) x (50 ohms);
V = $7.5x10^{19}$ electron volts per second; (5.9a)

The value of V = $7.5x10^{19}$ electron volts per second, is the required quantity of electrons that will travel to a 50 ohms resistance with the current of 0.24 Amperes and a voltage of 12 volts DC in every second.

Now let this paper, convert the above value into hour, as follows,

60 seconds x 60 minutes = 3600 seconds = 1hour; (5.9b)
$V(e^-)$ = ($7.5x10^{19}$ electron volts / seconds) x (3600 seconds / 1 hour);
$V(e^-)$ = $2.7X10^{23}$ electron volts per hour; (5.9c)

The value of $V(e^-)$ = $2.7X10^{23}$ electron volts per hour, is the required quantity of electrons that will travel to a 50 ohms resistance with the current of 0.24 Amperes and a voltage of 12 volts DC in every one hour.

## 6. Quantity of Electrons per Mole of a Pure Water Molecule

In every one molecule of water there exist a number of electrons and this is explained as follows, from College Chemistry [3], (King, Caldwell, Williams, 1977),
1 mole of water (H2O) = 10 electrons; (6.0)

Hydrogen has 1 electron = 1 x 2 atoms H = 2 electrons in water;
Oxygen has 8 electrons = 8 x 1 atoms O = 8 electrons in water;

Thus from the above statements 2 electrons of Hydrogen plus 8 electrons of Oxygen equals 10 electrons in one molecule of water.
From,
M (H2O) = $1.0038x10^{26}$ , molecules of atoms in one liter of water with three atoms per one molecule of water. (4.4)

From the above value this paper can now proceed to calculate the relative quantity of electrons present in a one liter of water molecule. This paper will simple multiply the value of M (H2O) = $1.0038x10^{26}$ molecules of atoms with 10 electrons per molecule of water then it can be shown that a value can be derived which is M = $1.0038x10^{27}$ electrons per one liter of pure water H2O, in mathematical form it can be shown to have as follows,

$N(e^-)H2O$ = M (H2O) x (10 electrons per molecule of H2O);
= ($1.0038x10^{26}$ atoms) x (10 electrons H2O);
$N(e^-)H2O = 1.0038x10^{27}$ electrons
per one liter H2O; (6.1)

Thus now it can be shown that this paper have been able to compute the quantity of electrons present in a one liter of pure water molecule.

**7. Ratio of the Quantity of electrons per 12 VDC of energy to that of the Quantity of electrons per One Liter of Pure Water H2O**

If this paper can be made to compute for the ration of the quantity of electrons per 12 volts DC of energy to that of the quantity of electrons per one liter of pure water H2O then this paper can create a value which is very significant to this present study at hand, so to express this in a mathematical form it can be shown to have a mathematical equation as follows, if this paper can denote the equation as follows,

w(t) = dQ / dT; (7.0)
Where:
w(t) = a value (H2O) which is a function of time;
dQ = a value (H2O) which is a measure of quantity;
dT = a value which is a measure of quantity with respect to time;

This mathematical representation is a computation of a certain value with respect to a certain quantity which is a function of time.
To simplify this equation this paper needs some of the derived values from the previous computations as follows.

$V(e^-) = 2.7X10^{23}$ electron volts per hour; (5.9c)
$N(e^-)H2O = 1.0038x10^{27}$ electrons
per one liter H2O; (6.1)

Then this paper needs to substitute the above values to the proposed equation as mentioned earlier, to put this in writing it can be illustrated as follows,

w(t) = dQ / dT; (7.0)

If this paper would substitute the values as follows,
Let dQ = $N(e^-)H2O$, and let dT = $V(e^-)$, and so,

w(t) = dQ / dT;
= $N(e^-)H2O / V(e^-)$;
= ($1.0038x10^{27}$ electrons H2O) / ($2.7X10^{23}$ electron volts / hour);
w(t) = 3717.777 H2O per hour;
This value of w(t) = 3717.777 H2O per hour, represents the cycle per hour of a $2.7X10^{23}$ electrons to be able to fully interact with the electrons of the pure water molecule in order to be able to separate the hydrogen and oxygen atoms in the water molecule.
Thus to be able to represent the value of w(t) = 3717.777 H2O per hour, as a value of time for easy understanding this paper will now divide this value with the quantity of time which is 3600 minutes in one hour, to illustrate this in a mathematical form it can be shown as follows, if this paper can write the equation as follows,

dQ = w(t) / dT;
where;
w(t) = 3717.777 H2O per hour;
dT = 3600 seconds ; in which,

dT = $T(t_2) – T(t_1)$; time difference; where, $T(t_2)$ = 3600, and $T(t_1)$ = 0;
dT = $T(t_2)$ – T(0); if $T(t_1)$ = 0, thus dT = $T(t_2)$;

Upon the scientific logical assumption that $T(t_2) = 3600$, is considered the standard based time of this paper computation.

If $T(t_1) = 0$, this means that no electrolysis process is taking place in the Water Molecule Power Reactor. And now substituting the values,

dQ = w(t) / dT;
 = (3717.777 $H_2O$/ 1 hour) / (3600 seconds);
dQ = 1.032 $H_2O$; Rate of Change of Quantity value with respect to time.

where,

$dQ = Q(t_2) - Q(t_1)$; Quantity difference with respect to time;

and

$Q(t_2) = 0$, the water in the reactor is fully depleted after one hour of elapsed electrolysis time,
$Q(t_1) = 1.032$, the water in the reactor is still 1 liter in quantity with zero electrolysis elapse time.

Therefore from the above values the time it takes for one liter of water inside the Water Molecule Power Reactor, to be fully depleted will be approximately 1.032 hours from the start of electrolysis process with a 12 volts DC energy source.

This value of 1.032 hours is based on a 3.125 percent water additive of Potassium Hydroxide from the total pure water volume of 1 liter.

Any quantity or specific values which this paper may arrive from the previous computations in the discussions is directly dependent on the water additive percentage value. Since the water additive percentage value directly controls the resistance and conductivity factor of water in the Water Molecule Power Reactor and in turn it directly affects the intermolecular interactions of electrons inside our Water Molecule Power Reactor and electrons is directly responsible for the output of hydrogen and oxygen gas in the proposed Water Molecule Power Reactor.

## II. CONCLUSION

Therefore this paper can safely say that in the final conclusion it takes approximately 1.032 hours to be able to totally deplete 1 liter of pure water inside a Water Molecule Power Reactor with an electrolysis process modification of adding 3.125 percent potassium hydroxide into the overall pure water volume of 1 liter.

Thus before one hour the water level must be maintained in the Water Molecule Power Reactor so that the Water Molecule Power Reactor can continue to produce hydrogen and oxygen gas. This gas is essential to the proposed intended production of electricity as a final product of the Water Molecule Power Reactor.

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