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# Design of a Hydrogen and Oxygen Power Reactor using Pure Water (H2O) and a Modified Electrolysis Process and Procedures

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**Abstract**

Power or Energy is an important part of the human modern daily life. It is the lifeline of any modern civilization.

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In all areas of man's modern life, energy is an integral part of the social community and society lives hand in hand with the essential existence of energy as a vital part of every mankind here in this modern planet. In the development of electricity as a source of energy, many forms of technology have evolved from the use of coal to power steam engines and the use of crude oil as a fuel to power modern engines and the use of nuclear energy to power nations and of course the development of renewable forms of energy such as the solar power energy, wind power energy, ocean current energy, water energy from the dams and many other forms of renewable forms of energy. One of these energy that human can harness is the energy which is abundant here on earth, is water and the energy of the sun. If the energy of the sun can be used to harvest the hydrogen and oxygen gas from water then humanity would have an unlimited power and energy for the future to come and mankind would and can help the planet earth restore into to its original state of a minimally polluted atmosphere and reduce the unprecedented natural calamities the world is facing due to global climate change. This paper highlights the fundamental principles of how this theory can be achieved and the procedures, methods, studies, experiments and research that have been examined in order to achieve what the researchers intend to accomplish as mentioned above which is the development of an energy of the future. This paper is a study on renewable forms of energy and renewable forms of energy is a new, milestone for science as science endeavors to create a sustainable and clean form of energy.

*Keywords:* Hydrogen; Oxygen; Electrolysis; Electric Power Turbine; Electrons; Renewable Source of Energy; Water; Space Exploration; Space Travel; Solar Power Systems; Reactors; Energy.

## 1. Introduction

Water as all mankind know is composed of two atoms of hydrogen and one atom of oxygen the combination of these two elements forms a unique molecule which is water. Water is very abundant in planet earth in fact in its abundance humans sometimes forget its importance. Water is life as all humans know and it brings everything to man from food, the air which all living things breathe, the ocean, the tress, the living creatures and everything on this planet earth, water is indeed life. Another unique and unbelievable feature of water is that it is a combination of hydrogen and oxygen atoms these elements is the fundamental building blocks of the whole universe. In nature water is composed of hydrogen and oxygen atoms in a liquid form however by the innovation of science humans can separate the hydrogen and oxygen from the water molecule and when mankind separate them they transform from liquid state to gas state. In gas state hydrogen and oxygen combined and in individual component can be highly flammable and in fact these two gases can ignite explosion. Both of these elements are used to power into space the rocket that brought man into space. Thus indeed this two elements can be used as a fuel and a source of an energy. If the proper conditions can be applied so that these elements, can be controlled and harnessed, as a source of fuel and energy then mankind can create this proposed another form of renewable source of energy, in fact this theory had already been made possible by many enthusiasts who go the distance to try this amazing form of energy. In this study, the authors wish to harness this energy so that, it can create and mimic a reactor that will power a turbine which will create a particular and certain amount of an, output electricity. In this study the energy of the sun will be utilized as an initial source of electricity for the reactor so that the electrolysis process can take place and the hydrogen and oxygen can be separated from water and once this process is ongoing the electric turbine will now produce electricity and the

reactor will now become self-energy sustaining reactor. Thus this whole system of reaction is energy independent from other forms of energy except for the solar energy as a process initiator. This study is limited only and is constrained only within the boundaries on the presentation of the fundamental functions of the schematic diagram as shown in the Simplified Schematic Diagram 1. For it is within the intentions of the authors and researchers of this paper to illustrate the fundamental principles and functions of the proposed hydrogen and oxygen power reactor as illustrated in the Simplified Schematic Diagram 1 as shown below in this writing. Though some introductory topics will be mentioned in this paper it is only for the purpose of identifying other parameters that can be fully discussed in later studies to be conducted by the authors of this paper. To discuss further the process of these reactions this paper will now show the readers, the simple schematic diagram of these processes as shown in a Simplified Schematic Diagram 1. The schematic diagram is a simplified schematic diagram illustrating how each individual component of the system works and how they contribute to the overall process so that a particular output can be achieved. In the illustration as shown, one might notice that this paper only use 12 DC (Direct Current) this is because this is a miniature scale for the purpose of illustration and for safety reasons as well. However as low voltage as one might think it is, this illustration is very capable of generating a unlimited power of 10 watts DC enough to power six 1.5 watts 12 Volts DC bulbs during night time when there is no sun light for the solar power. These 10 watts DC of output power is based only on a normal very minimal operation and computations not including some modifications into the system so that the output power will be higher. Thus as a point to the argument the above system as illustrated is capable of generating an unlimited output power supply to generate light in the darkness of the night. As a basic need in a small household is a light during the night especially in remote places were supply of electricity is nonexistent. The data gathered within the study of the miniature scale as this paper have conducted will become a vital tool in the pursuit of any advance technological development in relation to building a proposed hydrogen and oxygen power reactor using a modified electrolysis process of a pure water.
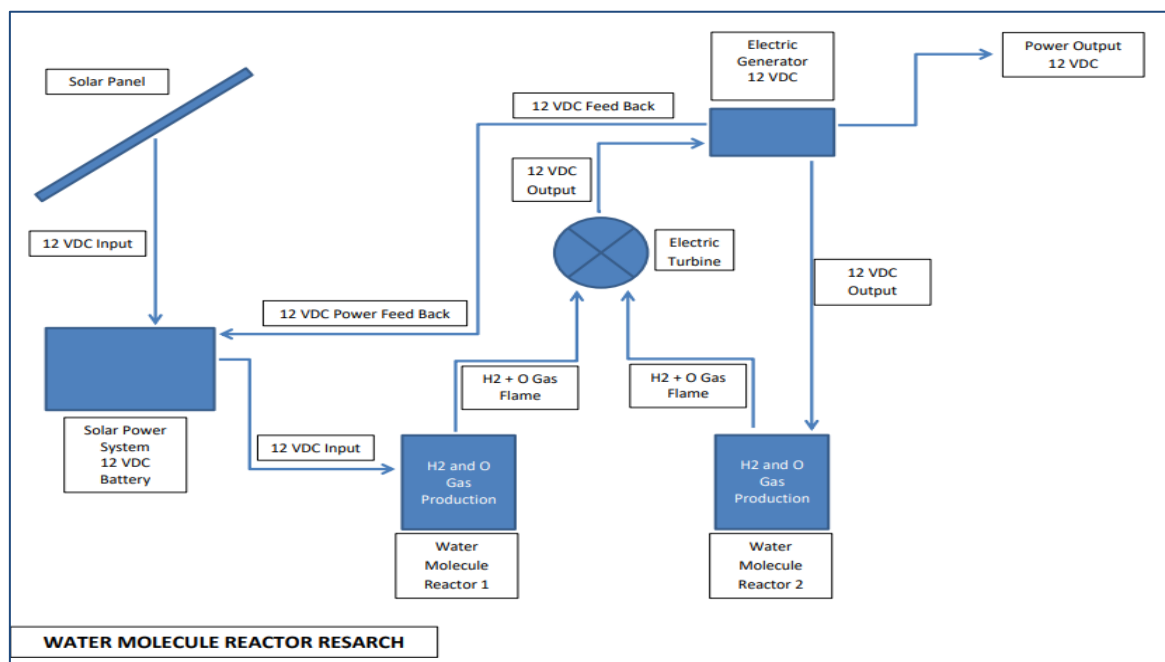


**Figure 1:** Simplified Schematic Diagram

Thus to begin the detailed elaboration of the how the system would work, this paper will begin first with the Solar Power System, second the proposed Water Molecule Reactor 1 system, third the Electric Power Turbine system, fourth is the Water Molecule Reactor 2 system and the flow of energy within the whole system. And so this paper shall begin.

### 1.1 Solar Power Systems

The Solar Power System in this study is being utilized so that it will generate the initial needed power for the generation of reaction in the Water Molecule Reactor so that the separation of the hydrogen and oxygen atoms can take place. Meaning the Solar Power System will kick start the process of hydrogen and oxygen gas production in the Water Molecule Reactor System; In this study the power generated by the Solar Power System in only 12 volts during the Day Time and this power is enough to create a reaction in the Water Molecule Reactor so that hydrogen and oxygen gas will be produced in a matter of seconds. The hydrogen and oxygen gas produced in this process will now be burned so that the flame will trigger the rotation of the electric turbine that will now generate an electric output of 12 volts DC (Direct Current). The Solar Power System is an independent system which will continue to operate on its own without human interference and it will automatically charge its battery when a certain threshold is down and it will automatically stop charging when a certain threshold is up. Thus the Solar Power System is independent and intelligent in managing its power output and input with respect to the operation of the whole system.

### 1.2 Water Molecule Reactor 1

The overall fundamental design principles of the Water Molecule Reactor 1 and 2 will be discussed in this chapter. To begin with the Water Molecule Reactor is a simple positive and negative conductor rods submerged in pure water and then this, conductor rods is connected to a power supply of 12volts DC. The water, pure water or distilled water has an additional powder substance in a form of a calculated amount of Potassium Hydroxide so that the water will become more conductive to the electricity and will react immediately with the flow of electric current and will produce immediately hydrogen and oxygen gas. In the positive conductor rod the output is an oxygen gas and in the negative conductor rod the output is hydrogen gas the combination of the two gases will produce a flame if burned and if not managed well it will explode dangerously. The byproduct of burning a hydrogen gas and an oxygen gas is pure water in the form of water vapor. The flame that will be produced in this process will now drive the Electric Power Turbine and the Electric Power Turbine in return will produce an electric power output. This electric power output is our main objective of this research and this is our energy of the future. Thus the Water Molecule Reactor 1 will need a supply of electricity which is 12 volts DC this energy requirements will be answered by our Solar Power System and to simply say that the Solar Power System will supply the energy requirements of the Water Molecule Reactor 1 only. Therefore the Solar Power System is the prime energy supplier to the energy requirements of Water Molecule Reactor 1 only. In this study the researchers used stainless steel conductor rods for the reactor to maximize the conductivity of the rods to that of the water. However it is with the collective judgment of the researchers that it will be much better if this study would use carbon fiber for the conductor rods on the reactor, simply because carbon fiber is not a metal but it is also a conductor which is typically what this study wish to use for the reactor conductor rods however in

this study the researchers used stainless steel conductor rods.

### 1.3 Electric Turbine Power Generation System

In this study the Electric Power Turbine Generator is a 12 volts DC Power Generator with a customized designed Electric Power Turbine System. The combination of an Electric Power Turbine System and a DC Power Generator will produce an Electric Power Output of 12 volts DC. According to this study the energy that will drive the electric power turbine to produce the needed electric power output will be the flame that will be produced by the water molecule reactor. Since in the authors logical assumption that the water molecule reactor will indefinitely continue to produce the needed hydrogen and oxygen gas which will be burned to produce the flame that will power and turn the electric power turbine and produce a corresponding electrical output. Thus if the reaction continues to sustain the power generation will also continue to produce the needed output of electricity and this process is nonstop once it starts to perform its intended functions. In this study the researchers used a small scale electric power turbine to examine the potentials in a miniature scale however in an industrial application's the electric power turbine can vary depending on the load and needed electrical output if scientifically assuming that every factors and scientific computations in the miniature scale is safe and sound.

### 1.4 Water Molecule Reactor 2

In this study the researcher incorporated a second water molecule reactor into the system however the, authors have come into a scientific conclusion that, this second molecule reactor may or may not be necessary at all or this may act as a standby reactor for the whole system. A standby reactor in this study is a reactor that maybe used in the instances of reactor repairs in the first reactor. Thus a fully functioning standby reactor is ideal in industrial applications so that in some instances wherein the first reactor is not available the second reactor will be called into action. In this study the second reactor will be powered by the Electric Turbine Power Generator and this second reactor will in turn power the Electric Turbine Power Generator. This second reactor according to this study will boast the electrical power generation of the Electric Turbine Power Generator. This may sound confusing but to say it simply, the second reactor will only be called upon to function if the need arises and the output requirements of the Electric Turbine Power Generators will become higher as the demand may dictate. Therefore it is safe to say that the second reactor is only a standby reactor ready to be put into action if the need of the whole system arises. This system of course is in our assumption is fully automated and needs no human interference and will be powered by powerful microprocessors that process data inside the system itself and use these data to create appropriate response and will create appropriate actions that will contribute to the safe and sound operation of the whole system. The system of course will be closely monitored by a human who will look into the data presented by the system and will be reflected in a computer screen.

### 1.5 Power Feedback Line

In the simplified diagram as shown in the Simplified Schematic Diagram 1, one might notice that there is a line coming from the Power Generator and going back to the Solar Power System battery, this line is what we call in

this study as the Power Feedback Line, this lines ensures that the solar power battery is fully charged at all times specially during the night when the sun is out and the solar power panel is not charging the battery. This Power Feedback Line is also fully automated, it checks the status and condition of the battery if the battery needs to be charged or not. If it detects that the battery needs to be charged then the system will automatically charge the battery now if the system detects that the battery no longer needs to be charged then the charging will now stop. This is to say that the Power Feedback Line is fully automated and needs no human intervention and it will function according to predefined set of rules and protocols.

## 2. Figures and Equations

There are many technical data that the authors might need to examine as a result of this research however the authors would only wish to simplify them in as much as it could so that anyone can understand what this paper are trying to convey to the readers. There are two properties of the data that will be presented in this chapter the first is the data on the properties of the Water Molecule Reactor and the second data is on the properties of the Electric Power Turbine. And so this paper shall begin with the first types of data. The first tasks for this research is try to compute the overall resistance of the Water Molecule Reactor so that it can calculate the Power Consumption of the Water Molecule Reactor System as a whole. The results on the Table 1. As shown below is based on the Pure Water computation with the following concentrations; the volume of Pure Water in this computation is 800 mL with a 25 mL concentration of pure powder Potassium Hydroxide as a water additive. Thus to say that the water additive of Potassium Hydroxide is only 3.125 Percent of the total water volume which is 800 mL, if the, researcher would increase the Potassium Hydroxide concentration to 5 Percent then the resistance of the water molecule will also be reduced. Note that the value of resistance was rounded to the nearest whole number for easy tabulation and understanding. The resistance value is also directly dependent on the water conductivity additives and design parameters of the reactor rods and the reactor itself.

**Table 1:** Electrical Properties of the Water Molecule Reactor

| Type of Reactor Rods | Number of Rods in the Anode (+) | Number of Rods in the Cathode (-) | Total Resistance of the Reactor | 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 |
| Carbon Fiber | 4 Rods | 4 Rods | 80 ohms | 0.15 Amperes | 12 Volts DC | 1.8 Watts |

Based on the tabulated data this paper can conclude that the Carbon Fiber rods (80 ohms resistance) have much more resistance properties than that of the Stainless Steel rods (40 ohms resistance). To reduce the resistance properties of the Carbon Fiber rods the researcher can increase the concentration of the Potassium Hydroxide by

more than 5 percent say 10 percent so that the conductivity of the water will also increase thereby reducing the resistance in the Water Molecule Reactor. Therefore the researcher can vary the internal properties of the Water Molecule Reactor by making the appropriate adjustments on the components that can be integrated into the proposed Water Molecule Reactor System. Another property of the Water Molecule Reactor that this paper, wish to examine is the volume of individual gas concentration of the output gas produced in the Water Molecule Reactor. This paper simply mean to say is that, what is the percentage quantities of Hydrogen Gas produced and the percentage of Oxygen Gas produced inside the Water Molecule Reactor. This data is important simply because this paper, wish to understand how much hydrogen gas and oxygen gas is produced and if the researchers can vary the volume of hydrogen and oxygen to give a particular combination of them both and the type or reaction the researchers wish to achieve to give a particular output of combined hydrogen and oxygen gas. To understand what the researchers mean let this paper, examine the following Table 2. Table 2. this paper will now examine the properties of the hydrogen and oxygen gas inside the Water Molecule Reactor and their corresponding Percentage Volume Gas Concentration depending on the type of rod combination that the, researchers would wish to use, the type of rod combination presented in the Table 2, below highlights the type of output gas that the, researchers wish to accomplish if the, researchers want a 50 percent hydrogen gas and 50 percent oxygen gas combination it will all depend on what type of output this paper wuold wish to accomplish.

**Table 2:** Hydrogen gas and Oxygen gas Percentage Volume combinations

| Type of Reactor Rods | Ration of Anode and Cathode Rods | Number of Rods in the Anode (+) | Number of Rods in the Cathode (-) | Oxygen Gas (Percentage Volume) (+) | Hydrogen Gas (Percentage Volume) (-) | Total Combined Output (Gas) |
|---|---|---|---|---|---|---|
| Stainless steel | 4:4 | 4 Rods | 4 Rods | 50 % | 50 % | 100 % |
| Stainless steel | 5:3 | 5 Rods | 3 Rods | 62.5 % | 37.5 % | 100 % |
| Stainless steel | 6:2 | 6 Rods | 2 Rods | 75 % | 25 % | 100 % |
| Stainless steel | 7:1 | 7 Rods | 1 Rods | 87.5 % | 12.5 % | 100 % |

The purpose of Table 2, presentation is that the, researchers are trying to reduce the hydrogen concentration on the output so that the, researchers can technically manage the output flame and thereby the researchers can create a variety of applications from the proposed Water Molecule Reactor system. As it was mentioned before the researchers can vary the internal components of the proposed Water Molecule Reactor system so that it can create an output corresponding to the user's desires and needs. Another important fundamental data that the authors wish to present in this research is the conductivity factor of the water inside the reactor with the introduction of Potassium Hydrogen as a water additive that is responsible for the increase in the conductivity

properties of water inside the Water Molecule Reactor. Salt can also increase the conductivity factor of water however the difference between the salt and potassium hydroxide as a conductive factor in water will not be examined in this research. Only the conductivity factor of potassium hydroxide will be tackled on this paper. Metal rods in the Water Molecule Reactor will corrode as the process of electrolysis continues which is why the researchers have suggested and concluded that it is ideally very good to use carbon fiber as conductor rods. In this study the researchers have not used the carbon fiber as a, conductor rods; however the, researchers have made a reactor design which was made by carbon fiber reactor rods which is why the, researchers were able to come up with some values as presented on Table 2, as previously shown. The use of carbon fiber rods as a, reactor rods is typically an ideal one because carbon fiber rods are nonmetal therefore they will not corrode as it is with metal conductor rods. The use of carbon fiber rods also needs meticulous design as they are not like metal conductors that can be easily be soldered in a miniature scale environment. However the corrosion of the metal rods will take sometimes first and in a very slow rate and will not affect the production of hydrogen and oxygen gas for the time being the data on the corrosion of the metal rods will not be discussed on this paper.

**Table 3:** Conductivity Factor of Water

| Type of Reactor Rods | Volume of Water in the Reactor (approximate) | Amount of Potassium Hydroxide (approximate) | Total Resistance of the Reactor (approximate) | Gas Output Level (H2 and O Gas) | Input Voltage (DC) |
|---|---|---|---|---|---|
| Stainless Steel | 800 mL | 0 mL (0.0%) | 100 ohms | Minimal Output | 12 Volts |
| Stainless Steel | 800 mL | 20 mL (2.5%) | 90 ohms | Medium Output | 12 Volts |
| Stainless Steel | 800 mL | 40 mL (5.0%) | 70 ohms | Medium to High Output | 12 Volts |
| Stainless Steel | 800 mL | 60 mL (7.5%) | 50 ohms | Very High Output | 12 Volts |
| Stainless Steel | 800 mL | 80 mL (10%) | 30 ohms | Extremely High Output | 12 Volts |

The above Table 3. Conductivity Factor of Water, simply wish to illustrate to the readers that if the, researchers increase the potassium hydroxide volume in combination with water the resistance of the water decreases, meaning the conductivity increases and the output gas produced also increases considerably higher. The value of resistance has been rounded to the nearest possible whole number for the purpose of easy understanding and the resistance value is also directly dependent on the design parameters of the reactor and the reactor rods. The next topic of discussion is in the area of our Electric Turbine Power Generator. The Electric Turbine Power Generator is the second most important component in our proposed Water Molecule Reactor Energy Generation

Research. Without the Electric Turbine Power Generator there would not be and the system would not be able to generate energy in the form of electricity and electricity is what the, researchers need in this research paper. There are a number of ways on how Electric Turbine Power Generator produce electricity one of this is the dam were water is forced into one outlet where the electric turbine is located and by the natural flow of water through gravity the Electric Turbine will turn and in turn will produce electricity. Another one is through geothermal power generation were the one that drives the Electric Turbine is the energy of the lava beneath the earth, the energy of the lava is utilized into a natural steam which power our Electric Turbine in a Geothermal Power Plant. Another one also is the nuclear power plant where in the heat produced by the nuclear reactor is converted also into a hot steam and it also drives the Electric Turbine and in turn produces electricity. In this research paper the Electric Turbine as have been proposed will be driven by the flame which was created by the proposed Water Molecule Reactor. The flame will be produced by burning the hydrogen and oxygen gas generated by the proposed Water Molecule Reactor. The researchers intend to and will design the flame to create a certain push or thrust so that it will push the Electric Power Turbine and in turn will keep it turning continuously and thereby producing the needed electricity. The design of the Electric Power Turbine will not be discussed in full detail in this paper however the researchers will try to explain the process in a very simple and understandable way. Like a Wind Power Turbine where the wind is responsible for the motion of the said power turbine in this research paper the proposed Water Molecule Reactor will be the one responsible for the continuous uninterrupted motion of our Electric Power Turbine as this paper wish to achieve. The combination of the proposed Water Molecule Reactor and the Electric Power Turbine will bring a very good promise of an unlimited supply of energy in the future provided of course that the researchers can control the flame produced in the reactor and produce a flame of the desired performance and technical specifications otherwise the whole process will not be productive and will not be a worthy endeavor to take. In this research, the authors only used an Electric Turbine Power Generator which is 12 volts DC for purpose of illustration and study, so that the authors can examine the potential of these systems in a large industrial scale environment. This system in its miniature form is technically capable of generating any desired power and flame outputs. In addition technology are all made in the laboratory in a miniature scale setting so that all technical parameters of the design can be assessed before such a design can be made in the industrial scale environment. To understand the potential of this technology the authors opted to create the fully functional miniature scale so that in such a scale it can somehow perfect the technology in a miniature scale applications. In fact the miniature scale system is technically designed to power the energy requirement of a single small house in terms of its lights and illuminations during the night and to power its dc powered gadget such as cellphones and a dc powered electric fan. The miniature scale system is designed to operate in this condition provided of course that all technical requirements are meet and the system is 100% fully operational. The other reason also for the miniature scale is that, not only can this works in industrial scale it can also work in the miniature scale to power say a drone system. As an example this drone project will be powered by a jet engine system powered by the proposed Water Molecule Reactor however this technology is still under development as one applications of the proposed Water Molecule Reactor Research. Thus the researchers can therefore say depending on the design and needs of the system it can create virtually anything under the sun in terms of creating an energy source for a variety of applications. Electrolysis Process is a known preexisting technology it has been around for quite some time amongst mankind, however in this study the researchers attempted to utilize this technology for the generation of energy which human might one

day use to power the modern civilization. The researchers created a simple full detailed structure of this technology in a way that is easy and understandable and explained the process in a modular scale so that they can be easily be understood by the readers.

## 3. Discussion of Mathematical Design Parameters

Many technical terms and mathematical equations have been omitted on this paper simply because the authors only wish to show the process of the proposed system and knowing in mind that mathematics form the intricate detailed backbone of this research and there are too numerous mathematical formulas to be considered in this publication alone such as in the fields of science particularly in physics, chemistry and mathematics. These equations and other mathematical formulas will not all be discussed in this article only those which are relevant at the moment.

### 3.1 Ohm's Law Equation

Some formulas which the, authors have used in order to arrive into the tabulated data will be discussed in this section the first formula which have been utilized is the formula of Ohm's Law [1]. According to University Physics [1] the current is directly proportional to the voltage but inversely proportional to the resistance which is in the mathematical form, it can be shown as follows, according to University Physics [1] (Young & Freedman 2016) and Electric Circuit Analysis [2] (Johnson, Johnson & Hilburn 1992),

$$I = V/R; \qquad\qquad (3.1.1)$$

Where;

$I$ = Current, Amperes (A);

$V$ = Voltage, Volts (V);

$R$ = Resistance, Ohms ($\Omega$);

Another formula is the formula of power [2], according to Electric Circuit Analysis [2], power is directly proportional to the voltage raised to the power of two and inversely proportional to the resistance, in a mathematical equation we have, according to Electric Circuit Analysis [2],

$$P = V^2/R; \qquad\qquad (3.1.2)$$

Where;

$P$ = Power, Watts (W);

$V$ = Voltage, Volts (V);

R = Resistance, Ohms ($\Omega$);

Furthermore, speaking of mathematics the, researchers shall say that one mathematical parameters that have not been discussed on this paper is the temperature, because as the process of electrolysis is in its peak and the supply of current into the Water Molecule Reactor is steady and constant the water inside the reactor produces heat normally due to the increase in the electron activity on the water. This heat is a product of the increased and very active intermolecular interactions of the electrons and atoms inside the reactor [3], according to University Physics [1] and College Chemistry [3].

### *3.2 Quantity of Heat Equation*

This heat also needs to be managed so that it will not affect the overall performance of the reactor although in the miniature skill this heat is manageable in an industrial scale that might create some technical problems, this can be addressed by introducing cooling systems into the reactor. The technical data on temperature with respect to voltage, resistance, current and power is not presented on this paper this type of data will be discussed in the next article which the authors will publish after this one. To illustrate the formula of heat according to University Physics [1] and College Chemistry [3] the authors, shall now say that Heat in mathematical equation is equal to, according to University Physics [1],

$$Q = mc \, \Delta T; \qquad\qquad (3.2.1)$$

Where;

Q = quantity of heat;

c = specific heat capacity of an specific material;

m = mass (kg);

$\Delta T = (T_2 - T_1)$ is the difference on the change of temperature from $T_1$ to $T_2$, respectively.

In this research the authors can compute the quantity of heat by putting into consideration that $T_1$ = the temperature of water under normal room temperature and $T_2$ = the temperature of the water in the reactor after a finite time in full operation. The unit for the temperature in this research is in degree Celsius (C°) [1]. And the specific heat capacity of water is 4190 J/kg**.**K or 1Cal/g**.**C°. The capital letter K denotes for Kelvin named from the British physicist Lord Kelvin (1824-1907) [1], where the value of Kelvin is equal to as follows, according to University Physics [1], and College Chemistry (King, Caldwell & Williams 1977),

$$0 \ K = \text{-}273.15 \ ^\circ C \ and \ 273.15 \ K = 0 \ ^\circ C \qquad\qquad (3.2.2)$$

$$T \ (Kelvin) = T \ (Celsius) + 273.15 \qquad\qquad (3.2.3)$$

### 3.3 Work Equation

Now one might wonder on how all this equation on the quantity of heat would relate into the present research, to answer this question the authors would again examine another formula which will bring the readers closer into the equation of a moving electrons in a given medium and this motion produce heat. The equation that the authors wish to look into is the equation of work. Work is mathematically presented by the following equation, according to University Physics [1] (Young & Freedman 2016),

$$W = F\ s; \tag{3.3.1}$$

Where;

W = Work, Joule (J);

F = Force, Newton (N);

s = displacement, Meter (m);

### 3.4 Kinetic Energy Equation

Since the movement of the electrons inside the reactor is sporadic and nonlinear this paper will now examine the more appropriate formula which is the kinetic energy of a particle in motion. To state this formula of kinetic energy let it say, and put this into writing such as, according to University Physics [1],

$$K = \tfrac{1}{2}\ mv^2; \tag{3.4.1}$$

Where;

K = Kinetic Energy, Joules (J);

M = mass, Kg (kg);

v = velocity, meters per second squared (m/s²);

The above equation of kinetic energy brings one closer into the kinetic energy of a moving particle and now the authors will, wish to examine how heat in produced in a particle that is moving at a definite velocity. Since water is composed of hydrogen atom and oxygen atom one might need to examine a formula which is focused on the molecular scale level of study and this can be answered through the study of physics particularly on the Molecular Properties of Matter [1]. In the molecular properties of matter it describes to the readers the, internal properties of matter that contributes to how matter interacts to each other in the molecular level and the properties underlying the existences of matter itself. Therefore the authors shall now begin the discussion with the formula of molar mass which will be discussed as follows.

### 3.5 Molar Mass Equation

Thus one will now examine another formula which is the formula of molar mass of any substance which is denoted by letter *M* and the quantity *M* is sometimes called *molecular weight* [1], however *molar mass* is mostly preferred [1], thus one may say in mathematical form, according to University Physics [1],

$$m = nM; \tag{3.5.1}$$

Where;

m = total mass of the material;

M = Molecular weight or Molar mass;

n = number of moles;

The above equation is very important in this research because when one is talking about the atoms of hydrogen and oxygen. For instance the atomic weights or the atomic mass unit abbreviated *amu,* which is defined in College Chemistry [3], that as 1/12 weight of one atom of the most abundant isotope of carbon which has been assigned a weight of 12 amu [3], according to College Chemistry [3] (King, Caldwell & Williams 1977). Furthermore also from the book of College Chemistry [3], it says that a mole is defined as the amount of a substance that contains as many elementary entities as there are atoms in exactly 12 grams of standard carbon-12 ($^{12}$C) [3]. This number of atoms has been determined experimentally to be equal to 6.022 x $10^{23}$ and it is known as the Avogadro's number (N) in honor of the Italian physicist Amadeo Avogadro [3]. According to College Chemistry [3], a molecule is defined to be as a union of two or more atoms and this constitute to a single compound. In this study the molecule which the, authors are very interested is the molecule of water which is of course composed of two atoms of hydrogen (2 x 1 amu) and one atom of oxygen (1 x 16 amu) therefore the molecular weight of water is 18 amu (u) or atomic mass unit (u) [3]. The atomic weight of hydrogen is 1 amu and the atomic weight of oxygen is 16 amu or grams/mole, from, College Chemistry [3]. The above definitions may seem very complex at this point and so one shall now look and point ones   attention to physics. This paper will now examine the principles of physics in the areas of the molecular properties of matter [1] and it says that. One mole of any pure chemical element or compound contains a definite number of molecules, the same number for all elements and compounds [1]. Additionally it says that the number of molecules in a mole is called Avogadro's number and denoted by *NA*. [1] The current best numerical value of *NA* is, according to University Physics [1],

$$NA = 6.0221367(36) \times 10^{23} \text{ molecules/mole}; \tag{3.5.2}$$

Also it says in physics that the molar mass M of a compound is the mass of one mole. This is equal to the mass m of a single molecule multiplied by Avogadro's number as follows [1], according to University Physics [1],

$$M = NA \ m; \tag{3.5.3}$$

Where;

M = molar mass, atomic weight, molecular weight;

*NA* = 6.0221367(36) x $10^{23}$ molecules/mole (Avogadro's number);

m = mass of a single molecule;

Now therefore one, have been able to illustrate the molecular weight of matter.

And matter as it is defined is anything which occupies a space, so in this article if the, researchers would wish to consider matter it will consider it to be the electrons that move around the water as the process of electrolysis in on going and is in active state.

### *3.6 Forces of Two Point Charges Equation*

The authors shall elaborate more clearly on this as the researchers move along with the discussion. With this idea the authors shall now show the mathematical formula between two point charges as follows, according to University Physics [1],

$$F = (1/4\pi\epsilon_o)(q1q2/r^2);\qquad\qquad (3.6.1)$$

Where;

F = Force between two point charges;

$\epsilon_o$ = permittivity of free space;

q1 = charge 1;

q2 = charge 2;

r = measured distance between the charges;

The formula between two point charges explains the interactive energy potential between two electrons interacting along the water inside the water molecule reactor and this interaction produces heat in the water. And now moving along with the subject of heat one shall examine the formula of Heat Current in Conduction because this is an essential element into the present study [1]. The intermolecular interaction of matter through conduction creates friction and this friction creates and produces a significant amount of energy which is heat and this heat needs to be understood and managed properly so that one can minimize the amount of heat produced in the proposed reactor so that the reactor can also continue to produce an output of the proposed system safely and intelligently.

### 3.7 Heat Current in Conduction Equation

To elaborate Heat Current in Conduction one shall write this in the following mathematical form, according to University Physics [1],

$$H = dQ/dT; \qquad\qquad (3.7.1)$$

Where;

H = Heat Current;

dQ = Quantity of Heat Transferred;

dT = Temperature Difference;

Also the above formula can also be written in the following form as shown,

$$H = kA\,(TH - TC)\,/\,L; \qquad\qquad (3.7.2)$$

Where;

H = Heat Current;

k = thermal conductivity, (W/m.K), (1W = 1J/s);

A = Cross Section Area of the rod;

*(TH – TC)* = Temperature Difference;

L = Length of the rod;

In the above equation it states the heat conduction properties of a single conductor rod and between the conductor rods inside in the water molecule reactor. Thus now the, authors have stated a number of principles that pertains to heat and now at this point in time one will now examine heat as it applies to electricity and to a certain electronic component. The electronic component that the authors wish to study of course is the Water Molecule Reactor System as being a system that is powered by electricity and thus the authors will therefore state the formula of what level of temperature range can an electronic component still operate and function properly [1], thus the formula is as follows, according to University Physics [1] (Young & Freedman 2016),

$$P = (Tec - Tamb)\,/\,rth\,; \qquad\qquad (3.7.3)$$

Where;

P = Highest Power Level at which a electronic component can still operate;

T$ec$ = Maximum Allowable Temperature of the Electronic Component;

T$amb$ = Ambient Temperature;

*Rth* = is the quantity of heat or temperature (Kelvin) that an electronic component can handle per watt, (K/W);

Thus now the researchers can compute the maximum allowable temperature that the Water Molecule Reactor System can still accommodate and for the reactor to still safely operate, however with this data on mind one can manage the heat inside the reactor and integrate cooling systems to significantly reduce heat. Additionally, another data not included on this paper is the rate of conversion process of water into its individual gas state of hydrogen and oxygen respectively. When one says the rate of conversion process what the researchers simply mean is that how many water is consumed in a given reaction process and the time factor in this given process. In calculus it says that the rate of change with respect to time. So therefore the rate of change with respect to time in this process is not discussed on this paper again they will be explained in the next article after this one. The rate of change with respect to time is a very important factor in the analysis of the input, process and output of this proposed research in terms of productivity, power output and management.

## 4. Explanation of the Tabulated Results

Additionally the researchers will now elaborate the simplified explanation of data on the tables presented on this paper as explained below. Table 1. Electrical Properties of the Water Molecule Power Reactor, this table illustrates mainly the resistance difference of the Stainless Steel Rods which is 40 ohms to that of the Carbon Fiber Rods which is 80 ohms. Meaning that the Carbon Fiber Rods (80 ohms) have higher resistance compared to Stainless Steel Rods (40 ohms) however the overall resistance on the Water Molecule Power Reactor can be significantly reduced by the introduction of the water conductivity additive which is potassium hydroxide. Table 2. Hydrogen gas and Oxygen gas Percentage Volume combinations, this table illustrates mainly the percentage content value or volume of hydrogen and oxygen gas produced in the electrolysis process with respect to the number of rods on the anode (+) and cathode (-) conduction terminals. If there are four (4) rods in the anode (+) and four (4) rods in the cathode (-) then the volume percentage is (50%) Oxygen gas and (50%) Hydrogen gas; However if there are seven (7) rods in the anode (+) and one (1) rod in the cathode (-) then the volume percentage is (87.5%) Oxygen gas and (12.5%) hydrogen gas respectively. In the anode (+) oxygen gas is produced upon the flow of current and voltage and in the cathode (-) hydrogen gas is produced upon the flow of current and voltage respectively. Table 3. Conductivity Factor of Water, this table illustrates mainly the reduction of resistance in the Water Molecule Power Reactor, if the volume of Potassium Hydroxide is increased with respect to the volume of water inside the Water Molecule Power Reactor. Example as illustrated on the table, if the Potassium Hydroxide content is (0%) the resistance is (100 ohms) and if the Potassium Hydroxide content is increased to (10%) then the resistance of the Water Molecule Power Reactor is reduced to (30 ohms). The increase in the Potassium Hydroxide content in the Water Molecule Power Reactor also directly increase the production output of hydrogen and oxygen gas. In the table that the author's presented on Table 3, Conductivity Factor of Water, the readers might notice that the, researcher were trying to decrease the volume of

quantity of the hydrogen gas produced and the, researchers were trying to increase the oxygen gas output. In relation to this, according to College Chemistry [3] (King, Caldwell & Williams 1977), oxygen gas tend to explode if ignited and hydrogen burn silently if ignited in fact to test a hydrogen gas if there is a slight mixture of oxygen gas the hydrogen gas will be ignited inside a test tube if the process creates an explosion it means that the hydrogen gas is not pure but with a mixture of oxygen gas however if the process burns quietly it means that the gas is pure hydrogen [3]. The researchers only presented the fundamental principles of this research for the author's only wish to present the potentials of this technology for the present and future human technological development. One of the future applications of this technology is in the areas of space travel, space energy sustainability and space energy requirements. And of course there are many, potentials to this technology if one can only learn to manage and enhance the power of the sun which is the hydrogen.

## 5. Conclusion

In the conclusion of this paper, the researchers can say that based on facts that were presented the design of the hydrogen and oxygen power reactor with the use of pure water is a very promising and a very interesting field of study for present and future applications in the miniature and industrial scale. The combination of the percentage output of hydrogen and oxygen of **Table 3**: Conductivity Factor of Water; creates many potential applications depending on what application requirements is needed and correspondingly what percentage combination is required to produce a desired output of any given needs.

## 6. Recommendations

The researchers recommends to the readers of this paper to further conduct studies to the subjects mentioned in this research and extend their knowledge to the researchers of this paper and anyone with the same passion so that a productive collaboration on this technology will be fruitful for all of mankind as the world struggles to create a sustainable and renewable forms of energy for the present and in the future here in this planet and in the outer space.

## Acknowledgements

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