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Improving the Voltage and Ampere of an Aloe Vera Battery with series and Parallel Connections

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ABSTRACT

In today's world due to growth of high population the needs of fossil fuels demand and pollutions coming out of using fossil fuels are high. The entire world is focusing on the renewable sources of energy for pollution less and easily available sources to replace the fossil fuel. In this paper we used aloe vera plant as an energy producing device, electrical energy is produced with the help of aloe vera plant leaves in terms of electrical energy generation under specific experimental setups. This energy has a high potential to be used to power up a low or medium power consumption device. Aloe vera battery is used to increase voltage in series connections, from the journal papers an analysis is made in this paper. Multiple connection of aloe vera battery in 3 pair output voltage 3.40v and 0.5amp. Series connection used voltage increasing, parallel connection used amp increasing, the aloe vera battery consumes the fully green battery not affect environment. Don't mixing some other chemicals in this type of battery. The battery designed segment type 2 rows, 12 columns is containing the copper plate and zinc plate each of the pair. 24 pairs 18v will be containing the battery. The environmental problem is rectified in this project. The voltage to be increasing maximum of output will solving the project.

KEYWORDS;Renewable source, aloe vera bio degradable, not affect environment, Serious connection increase the volt.

INTRODUCTION

In order to protect our future and the environment, renewable energy sources have been intensively explored. Switching to renewable energy sources for power generation enables benefit management solutions from an environmental standpoint. Wind energy, solar energy, ocean energy, and ambient power harvesting such as piezoelectric are all examples of renewable energy sources. Plant-based energy generation is a technique for extracting electricity from living plants. Living plants can be used to harvest energy in an environmentally friendly, cost-effective, and most crucially, locally abundant manner. This limitless supply of energy, which is practically all around us, may be transformed into usable electric power. Many of the safety problems associated with fossil fuels do not apply to plant-based energy.

In21st century has been created a series of low power consumption and smaller size consumer electronics. The concept of aloe vera battery is due to adopt the smaller size electronics device. Today usage of more electrical accessories depends on battery. Watch, mobile phones, laptop, etc. some other devices fully battery consumed. As the charges of the batteries drained over time due to control utilization, the vitality collecting framework is required to energize these batteries to maintain the usefulness of the gadgets. The aloe vera battery used to many purposes electrical and electronics device alternative source to usage battery. vitality emergency is one of the major concerns in today's world due to quick draining assets of petrol, diesel and normal gas. Petrol, diesel some other fuels price to be high and environmental pollution to be occurred day to day. The next generation adopted for fully battery vehicles. Mostly used for lithium-ion batteries. This project has various benefits both to the members of the team and also external benefits thereby making awareness of using alternative modes of transports. aloe vera battery concept is very useful to the modern life there is cheapest and bio degradable. Don't affect the environment no pollution. In general, a battery is made up of zinc as an anode, carbon as a cathode, and an electrolyte made up of Manganese Dioxide (MnO2) paste, carbon powder, and Ammonium Chloride (Nh4Cl) as the electrolyte. Battery, on the other hand, is a nonrenewable energy source.An electrochemistry process occurs when electrodes are embedded in plants, converting chemical energy to electrical energy via an oxidation-reduction reaction**.** The oxidation process at the anode electrode and the reduction process at the cathode electrode cause electrons to flow from the anode to the cathode electrode, producing electricity.

2. EXPERIMENTAL MATERIALS DETAILS

2.1 COPPER

Fig.no 1. Copper plate

Copper is one of the best conductors of electricity. Many components benefit from a coating of copper because it provides good electrical conductivity. Copper plating is therefore employed in both the electrical and electronic industries. Copper is a soft metal that can be used to make metal pieces with some flexibility. The copper coating will not peel away from the metal surface since it adheres to it even when bent. On most non-ferrous and certain ferrous base metals, it provides uniform covering.

In this project we choose the copper material because it will be high ductility, medium strength and good resistance to correction. Copper is a good conductor of heat better than steel and alumininum. Batteries are designed for maintain a reversals electrode potential. Copper is used for powering of sustainable technology for its durability then charging of batteries. Copper is main function as current all anode collects the batteries. Copper is a renewable energy of production in this system 100% is a recyclable. Then we can used 24 pairs of copper plate and its size are 70mm Hight and 0.5mm thickness.

2.2 ZINC

Fig.no 2. Zinc Plate

It is mostly used for galvanizing iron (more than 50% of metallic zinc is used in galvanizing steel), but it is also employed in the creation of certain alloys. In some electric batteries, it's used for the negative plates. The primary purpose of zinc plating is to protect metals from corrosion. Zinc coatings establish a physical barrier and operate as a sacrificial anode, preventing corrosion of shielded metal even when the barrier is destroyed. Zinc and iron/steel are combined in an electrolyte to form a cell, with the zinc serving as the anode and the steel as the cathode. The zinc is then sacrificed, and the steel remains rust-free. In project Zinc used for Anode (- ve) in batteries. Zinc is stable in air and comfortable rechargeable batteries. It is increase self-discharge and corrosion of the cell. Zinc is a brittle metal because malleable at temperature 100 to 150 C. Zinc is passing of an electric current one to another element. Zinc melting point is 419.5C.

2.3 ALOE VERA

Fig.no 3. shows the physical outlook of an Aloe Vera

Fig.no4. Shows the convert to Aloe Vera gel

Fig.no 5. Solid fleshy gel of the Aloe Vera.

Aloe Vera, also known as "Aloe barbadensis," is a plant that originated in North Africa and expanded to rich, temperate regions. It has a cactus-like appearance, with a thick rind concealing a succulent Centre made mostly of water. This Aloe Vera plant has a special property in that it can thrive without water in any climate. When compared to all other plants, this plant has a longer lifespan.

Aloe Vera is a stemless plant that grows to 60–90 cm (24–36 inches) in height and spreads through offsets.Water is stored in Aloe Vera's expanded fleshy leaves, stems, or roots, as depicted below. The water content of aloe vera gel is roughly 99.3%. Solids make up the remaining 0.7 percent, with glucose and mannose polysaccharides accounting for the majority This enables them to thrive in arid conditions. The

inside, meaty section of the Aloe Vera leaf is clear. It is nutrient-dense and excellent for internal and external consumption. The aloe vera plant can generate electrical energy naturally.

We are conducting a short experiment to demonstrate the electrical property of the aloe Vera plant. To demonstrate the electrical properties of aloe Vera needles, single lead copper wire, multi-meter, Aloe Vera plant

Aloe vera extract separate fleshy gel and it fill the battery box. Fix the anode and cathode material on series and parallel connection. We used an Aloe Vera plant in this experiment. To On two edges, Copper and Zinc are placed into the Aloe vera container box. A single lead copper wire connects each needle. A multi-meter is connected to one end of the copper wire to measure the electricity generated. The presence of chemical qualities in aloe Vera leaves (calcium, magnesium, zinc, chromium, and selenium) aids in the creation of electricity. When needles are put into an aloe Vera leaf, the copper and zinc present in the leaf gel generate electricity due to the electrolysis process that occurs inside the leaf.

2.4 FOAM BOARD

Fig.no 6. Foam board

Foam board is also known as foam core board is a strong and lightweight material that can be cut simply with a sharp craft knife. Foam board may be easily shaped into shapes for interior

Design and architectural project work. The foam sheet is used as a container for aloe vera battery. The form sheet does not conduct the water. The battery container size is 15cm wide and 30cm long and its container box will be separate 24 pairs.

3. EXPERIMENTAL METHOD AND DESIGN

To make the extract, aloe vera is grated or mixed. Aloe vera, grated or blended, and a box-shaped container are required at this stage. This aloe vera is shredded or mixed into smaller particles, such as electrolytes in batteries, to make juice. As a result, aloe vera extract can be used to replace the electrolyte in batteries with high electrolyte levels. The aloe vera extract is divided into partitions with the equal amount of aloe vera extract in each.

Negative and positive electrodes should be inserted and installed on each partition in the box. You'll need wires or cables, zinc sheets, copper sheets, and alligator clips at this point. Plates with the same cross-sectional area are cut from copper and zinc sheets. The cable is then cut into smaller sections of the same length. After that, it's wrapped around each plate and plugged into each box in the same amount. The anode (positive electrode) of the dry element (battery) is a carbon rod, and the cathode is a zinc electrolyte envelope (negative electrode).

Assemble each partition using cables that include a zinc plate (Zn) as the cathode (negative electrode), a copper plate (Cu) as the anode (positive electrode), and aloe vera extract as the electrolyte. Measure the voltage created in the circuit, keep track of the results, and document everything. Check the aloe vera box for electronic equipment energy sources.

3.1DESIGN

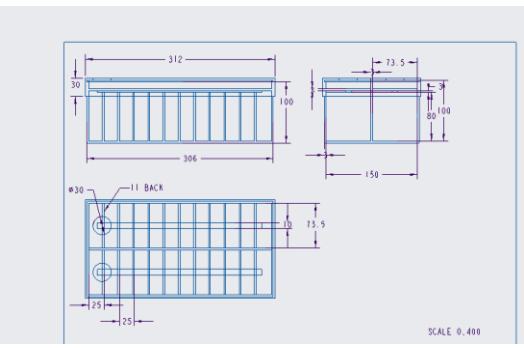

Fig.no 7. 2d Design box

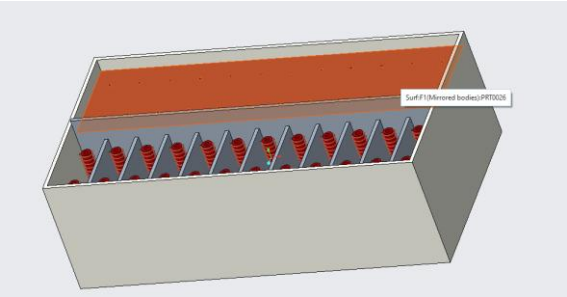

Fig.no 8. 3d Design box

Design a battery box containing 24 partitions with each partition measuring 7cm x 5cm x 10cm for the manufacture of bio-batteries based on aloe vera extract. Insert and install negative and positive electrodes on each partition in the box. At this stage you will need wires or cables, zinc sheets, copper sheets, and alligator clips. The copper and zinc sheets are cut into plates with the same cross-sectional area. The cable is then cut into smaller sections of the same length. Then it is wrapped around each plate and the plates are plugged into each box with the same amount.

4. TESTING OF VOLTAGE, AMPERE AND TIME

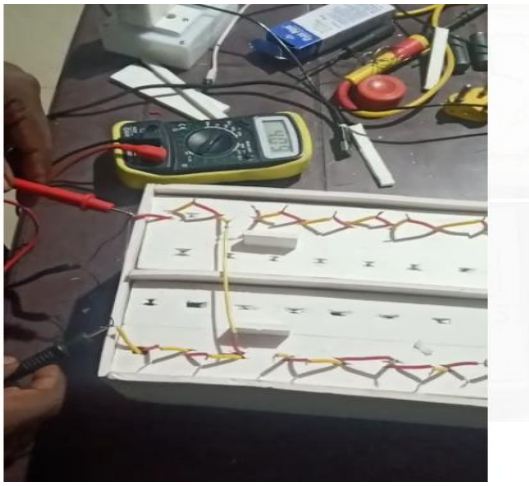

Fig.no 9. Recording voltage

Table 1.Record the Voltage and Time Results Without load in series connections

S.NO	TIME(T) IN MINUTES	VOLTAGE (V)
1	0	0.92
2	10	1.64
3	15	2.8
4	20	3.52
5	25	5
6	30	6.3
7	40	7.89
8	60	8.23

Testing and analyzing each partition with cables which are realized in series with a zinc plate (Zn) as the cathode (negative electrode), copper plate (Cu) as the anode (positive electrode), and aloe vera extract as the electrolyte. Measure the voltage generated in the circuit, record the voltage

results and do documentation, Test the box containing aloe vera for energy sources for electronic equipment.

4.1 SERIOUS CONNECTIONS

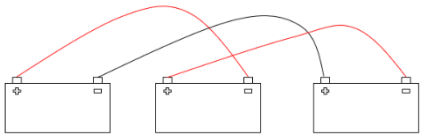

Fig.no 10. Serious connections diagram

Connecting two or more batteries in series raises the voltage of the battery system while maintaining the same amp-hour rating. To link batteries in series, connect one battery's positive terminal to another's negative terminal until the necessary voltage is reached.

4.2 SERIOUS CONNECTIONS TESTING RESULT

Table 2. Record the Voltage and Time Results With load in series connection

VOLTAGE WITHOUT CHARGEING	8.23 volts
AMPERE WITHOUT CHARGEING	0.1milliampere
CHARGE TIME (hr)	1hour
VOLTAGE CHARGEING THE BATTERY	11.41 volts
AMPERE (10Amp) RECHARGE	0.1 milliampere
LOAD	4v LED light
DISCHARGE TIME	4 hours

The influence of series connection variance among aloe vera plants on harvested voltage and current is investigated in this experiment. Then, using the same cross-sectional area and wire coils, zinc (Zn) is plugged in as the cathode (negative electrode) and copper (Cu) as the anode (positive electrode). It is also intended that the findings in each cell be the same. The boxes are also connected in series because the enormous series resistance allows the same current to flow through each resistance. Twenty-four different series connection configurations are studied. In a series connection it comes to 7.23 volts without charging in 24 pairs of which 1 hour recharge is generally 11.43 volts charge amps 0.2 A comes 4-volt light 4hour burns.

4.3 PARALLEL CONNECTIONS

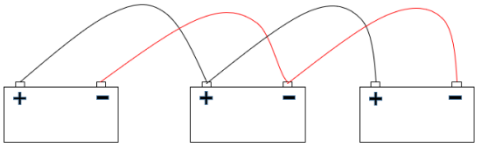

Fig.no 11. Parallel connection diagram

The appropriate operating voltage is achieved by connecting numerous cells in series; each cell's voltage potential is added to arrive at the total terminal voltage. The overall ampere-hour capacity of a parallel connection is increased (Ah)

4.4 PARALLEL CONNECTIONS TESTING RESULT

Table 3. Record the Voltage and Time Results With load in series connection

VOLTAGE WITHOUT CHARGEING	0.954 volts
AMPERE WITHOUT CHARGEING	0.1 milliampere
CHARGE TIME (hr)	1hour
VOLTAGE CHARGEING THE BATTERY	2 volts
AMPERE (10Amp) RECHARGE	0.6 milliampere
LOAD	4v LED light
DISCHARGE TIME	4 hours

The influence of Parallel connection variance among aloe vera plants on harvested voltage and current is investigated in this experiment. Then, with the same cross-sectional area and wire coils of the same size, zinc (Zn) is plugged in as the cathode (negative electrode) and copper (Cu) as the anode (positive electrode). Each cell should also have the same findings. Furthermore, because the huge parallel resistance has the same current flowing through each resistance, the boxes are arranged in parallel. In a parallel connection 24 pairs voltage outcome has 2.23 volts without charging which is the general 4.43-volt charge for 1 hour recharge is 0.3A amps 4 volts and it's nolight.

4.5 SERIES AND PARALLEL CONNECTIONS

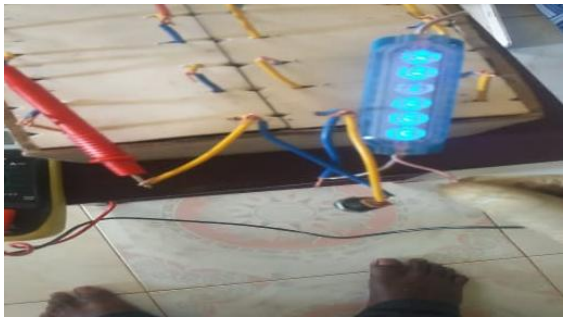

Fig.no.12 LED Light testing series and parallel connections testing

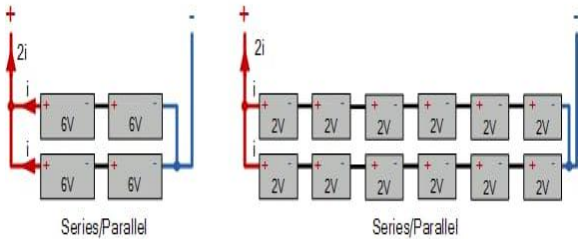

Fig.no 12. Series and parallel connection diagram

When two pairs of two batteries are linked in series and then connected in parallel, this configuration of batteries is referred to as series-parallel connection of batteries.

In other words, it is a series-parallel circuit that is neither series nor parallel. Some components are connected in series, while others are

connected in parallel, or a complicated circuit of connected series and parallel devices and batteries.

4.6 SERIES AND PARALLEL CONNECTIONS TESTING

Table 4. Record the Voltage and Time Results With load in series connection

VOLTAGE WITHOUT CHARGEING	7.54 volts
AMPERE WITHOUT CHARGEING	0.1 milliampere
CHARGE TIME (hr)	1hour
VOLTAGE CHARGEING THE BATTERY	8.98 volts
AMPERE (10Amp) RECHARGE	0.5 milliampere
LOAD	4v LED light
DISCHARGE TIME	4 hours

The influence of series and parallel connections between Aloe Vera leaves on the amount of voltage and current gathered from the plant under no load conditions is investigated in this experiment. In a series and parallel connection 24 pairs voltage outcome has 7.54 volts without charging which is the general 8.98-volt charge for 1 hour recharge is 0.5A amps 4 volts light burns 4hour

5. CONCLUSION

Based on the results of experiments that have been conducted, it can be seen that the way of creating bio-battery based on aloe vera extract is very easy. The voltage generated by the aloe vera extract battery box in a series circuit and parallel circuit is 18 volts. The aloe vera extract battery box that has been tested, is capable of turning on LED lights, 6V incandescent lamps. In addition, the use of aloe vera extract as a battery has advantages because it is more environmentally friendly, rechargeable, cheaper than ordinary batteries and the energy produced is larger.

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