AN INVESTIGATION OF SOIL BATTERY VOLTAGE EFFICIENCY WITH SEVERAL OF PARAMETERS

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ABSTRACT This research was set to generate the electricity from the soil. Cation in which the principles of soil minerals with positive and negative ions are reacted with the cathode and anode. As this principle, the output voltage is generated to the terminal out. By bringing each soil type is clay loam, sandy clay, sandy loam. It test the voltage in the soil at temperature and moisture constant with same condition of volume , acidity and alkalinity. The cathode and anode sheets material are copper and zinc, respectively. The results showed that acid soil produces the best voltage about 1.4 volts per cell. The system power consumption is tested using 12 Volt LED with 17 to 15 hours long, which is the free energy at no cost.

1. INTRODUCTION

Currently, power sources have been escalated rapidly requirement in a moment, which power source use to produce electricity is reduced. For instant, gas, mineral and heat underground might not sufficient to support additional requirements for producing electricity in the future. So, we have to find new sources or new substitute sources to reduce using main power sources .

The energy from soil used to produce electricity, although not sufficient to meet demands for electricity. The energy can reduce their dependence on primary energy. However, earth soil chemical reactions and electron affinity based earth batteries may be explored for low to high voltage DC potential to drive small scale white emission LED lighting loads in remote hilly areas or small scale electronic devices . They can also be considered to replace high voltage low current charging power supplies or ionization power supplies .

However, the problems encountered in the production of electricity from the soil are a small charge of electricity which needs to increase the power of the original. This study is use soil to produce electric current to produce of soil. It has specific gravity and moisture of soil changed. The output voltage achieved from common materials.

In this research study is to design and construct the batteries from the soil. Using distilled water vehicle. A medium that allows for increased electricity production. The key test in two categories: 1) the type of soil, such as clay, sand, loam, clay, sand, salt, etc. 2) the nature of the soil, such as soil, dry soil moisture.

For a study factor charge and discharge column voltage of soil and application used low power load such as LED lighting load, clock battery load and mobile battery charger load, etc.

2. ERATH BATTERIES SYSTEM

Erath battery is a battery power produce from soil which can generate electricity. The different metal sheets cathode and anode put into soil to the oxidation reaction at the cathode, and reduction of the anode to produce voltage. It cans charge from soil are shown in Table 1.

Table 1. Potential of common metals sheet suitable for earth battery.

Anode materials		Cathode materials		Battery
Materials	*E°(V)*	*Materials*	*E°(V)*	*Volts*
Magnesium	-1.75	Coke	+0.30	2.05
Zinc	-1.10	Graphite	+0.30	1.40
Zinc	-1.10	Copper	+0.20	0.90
Aluminum	-0.80	Carbon	+0.30	1.10
Iron	-0.50	Coal	+0.30	0.80

The material with higher capacity can absorb more tightly to the pole. Therefore, the nutrient management of plant, soil is not only. The concentration of nutrient ratio was the most significant to evaluate the soil nutrient fertility. It has method measuring the value of the Cation Exchange Capacity (CEC) or the capacity to exchange ions percent saturation of the pH. The ratio of concentrations is between nutrients in form of ions or ion with earth battery of the same size to be different.

The CEC or the capacity to exchange ions can be used as a measure for the size of the earth battery capacity or means to contain nutrients. The energy of the soil battery is clay which has organic matter or high humus is very likely that the CEC high ground even with the CEC are the buffer is to be able to charge or energy. The CEC is positive such as; calcium, magnesium, potassium, and sodium are exchange which can be absorbed into the surface of the nth particle, or by measuring the CEC of the soil.

The chemistry will be measured out to be milli-equivalents per 100 grams (meg/100g) by the value of each of the ion-exchange capacity (CEC) electrolytes with different conductivity. Usually, the battery will not work unless we fill the water alone, but must have the power to make acid cause to current.

3. EXPERIMENTAL SETUP.

In experimental design, the plastic bottle is then applied in the experiments. Cut to size, then take the same kind of rock debris, leaves, trash or debris pick out. The soil used in the experiment is clay loam, sandy clay and sand into the prepared container. By putting in a volume equal to that of copper rod (anode), an air duct sizes ¾ inch long, 10 cm connecting cable to use. Zinc plate, 20 cm long and 10 cm wide, as shown in Fig. 1, and it compares the results.

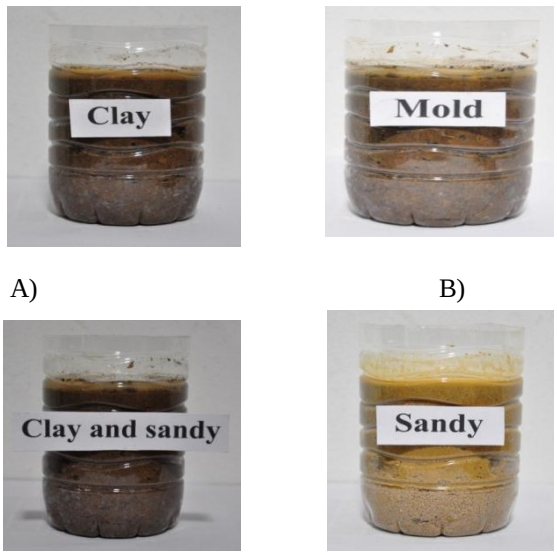

Fig.1. Battery of soil types: a) Clay, b) Mold, c) Clay and sandy and d) sandy

The experimental study was the power of soil. The study of the physical properties and the chemistry of various soil are affecting the chemical reaction cause causes oxidation to the metal anode and cathode to result in the highest voltage. The electrode soil reaction voltage 1.09-V may be used to drive small scale lighting and electronic loads. Outside on bare earth the currents and voltages were found higher at smaller distances and lower at relatively larger distances between cathode and anodes. The voltages and currents readings were found unstable on the digital multi-meter. Repetition of above experiment with interchange of electrodes from north to south resulted in relatively increased voltages and currents.

4. EXPERIMENTAL RESULTS.

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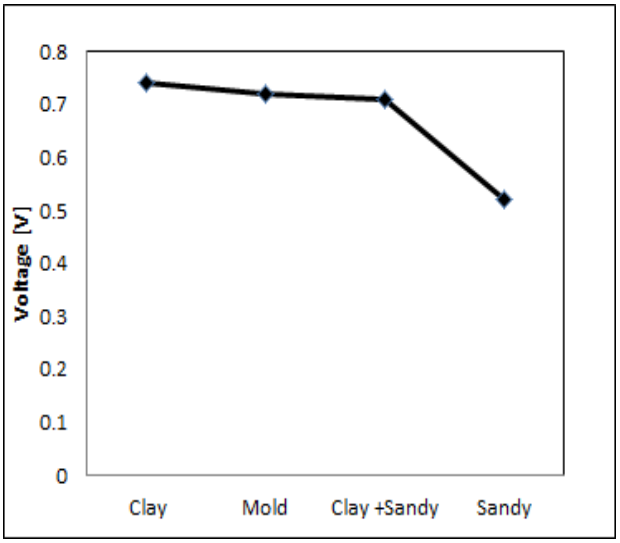

Fig.2. The relationship between the voltage on each soil type.

Change the types of experiments to compare the voltage per cell. Volume of the same capacity. Voltage optimized by the percent moisture of soil types, about 40% soil temperature each average 28 degrees Celsius and pH - alkaline soil types averaged 6.9 pH, as the graph in Fig. 2 shows that soil. clay is the best voltage is 0.75 volts per cell.

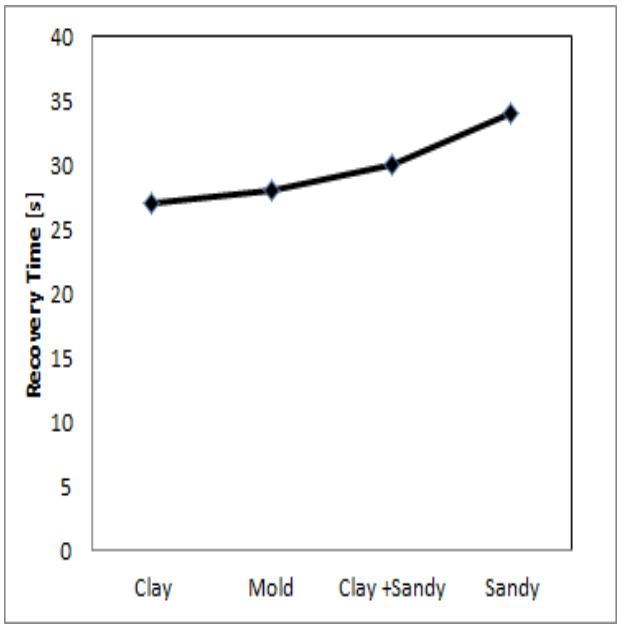

Fig.3. The relationship between the recovery time on each soil type.

In Figure 3, it was found that the average recovery time are about 20-30 seconds. The clay soil is the best in this condition.

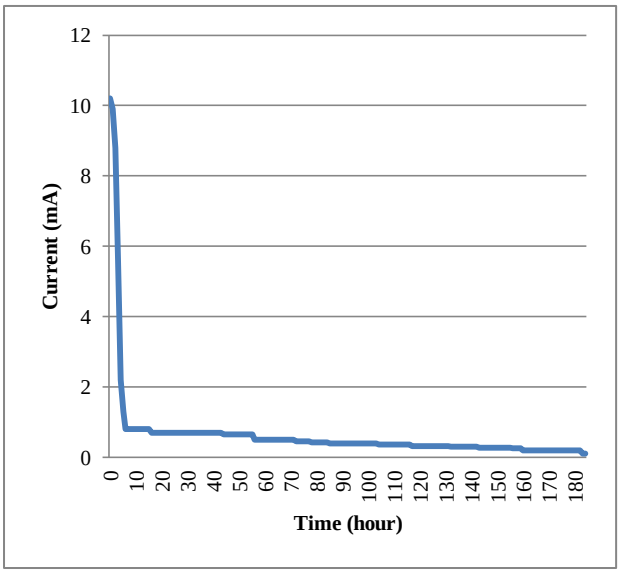

Fig.4. The current output of earth battery to LEDs load.

In Fig. 4 is relatively between current can be current start at 10.20 mA and decreased 1mA during 8 hours because a current form soil is low and low surface are for the ion exchange oxidation and reduction that cause low electricity.

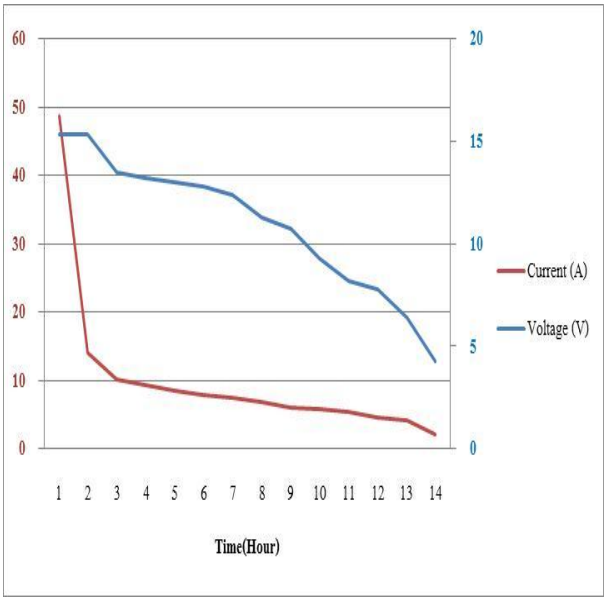

Fig.5 The relationship between voltage and current to the LED lamp at the left.

Figure.5 is a graph LED lamps were set aside until the end of the LEDs on the load test voltage from 12-cell 15.3 volt lamp current 48.6 mA LED light. During the two-hour flow decreased rapidly. Because ions in the soil was converted from acid to alkaline. Positive and negative side. Flow less. And in 14 hours the LED lamps do not contain residual voltage 4.3 V. The current minimum 2.1mA Song and observations on soil that is used. The ground began to dry surface soil water.

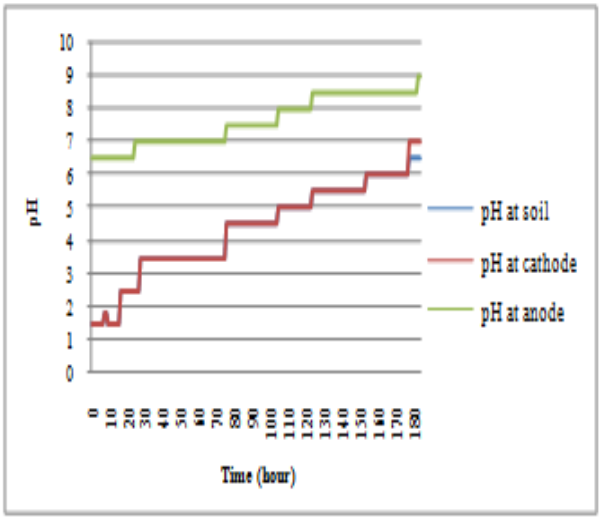

Fig. 6. The parameter pH of earth battery to LEDs load.

The experimental result of pH value in shown Fig.6 when take the LEDs load found the pH marl soil at the cathode has than anode (pH = 1.5). It causes the sulfur oxide and bubbles around the anode and the cathode.

5. CONCLUSIONS.

The results of the studies and testing of the battery from the soil using distilled water as the medium. The different types of metals copper and zinc. A superconductor. The soil is best. Clay moistened with distilled water. When the cells. Serial production will increase pressure increase. Can be used with LED bulbs have many long and is available with the addition of the battery can also charge a cell phone battery charge as well.

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