

ELECTRODE PERFORMANCE EFFICIENCY FOR A NEWLY DESIGNED SALTWATER LAMP PROTOTYPE

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The harvest and storage of electrical energy from renewable sources have become increasingly important in order to meet electricity energy demand for future generations. A new promising renewable energy source known as saltwater power has the potential to generate electrical power. Among the products that utilize this technology is saltwater lamp which is currently being introduced in the market. Saltwater lamp is a Light-Emitting Diode (LED) lamp which is powered by a battery, specific alloy galvanic cell of anode and cathode with an electrolyte solution of salty water (seawater) which can provide 8-10 hours of light at one time and up to 100 hours. However, the current design of saltwater lamp which uses the Magnesium (Mg) will corrode over time when it is in contact with saltwater. The replacement of the Mg electrode is expensive and hard to source locally. Therefore, this research is focusing on producing a newly designed saltwater lamp prototype for electrode performance efficiency. To realize this mission, there are a few types of experiment conducted to identify the types of parameters in generating a higher amount of electricity in the saltwater lamp. The findings obtained from these experiments will be used to design and develop a prototype of a newly designed saltwater lamp that uses cheaper, easy to find and better durability electrode. Based on the result from the experiment, it was found that Aluminium-Carbon (Al-C) and Aluminium-Copper (Al-Cu) produced maximum voltage and efficiency with the increasing number of cells connected in series, increased in the device size as well as in electrode surface area give a high voltage output when submerged in salt water solution. Racking mechanism has been selected to operate the newly designed of saltwater lamp prototype to solve problems and dissatisfaction needs. Based on the test conducted on the new design of saltwater lamp, the time taken for electrode to degrade is longer compared than if the electrode is submerged in the salt water at all time. Therefore it can be conclude that, the performance efficiency of the electrode is achieved through the new design of saltwater prototype in terms of electrodes durability and functionality. It is expected that the new design of saltwater lamp has the potential to deliver stable light source to be used in rural areas that will contribute to a better quality of life.