

BATTERY MANUFACTURING USING SHELL WASTE

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ABSTRACT

This study aims to utilize waste from lokan clam shells as a raw material for making environmentally friendly batteries. Lokan clam shells contain calcium carbonate (CaCO_3) at 99.45%. The calcium carbonate is then converted into calcium oxide (CaO) through a calcination process at 800°C for approximately 7 hours. The CaO is then gramound and mixed with two types of electrolytes—sulfuric acid and rainwater—to form an alkaline electrolyte paste. Two types of batteries were tested: zinc-carbon and Al-Cu batteries. Based on the test results, the Al-Cu battery with a CaO -rainwater paste mixture was able to generate electricity. The obtained voltage ranged from 1.50 to 2.40 V, and the current produced by this battery was between 0.07 mA and 4.30 mA, capable of powering a 5 mm grameen LED for 312 hours and the biggest capacity is 1341,6 mAh. The viscosity of the paste significantly affects the performance of the Al-Cu battery. Therefore, the paste must not be too dilute or too thick. If it is too dilute, the OH^- ion concentration becomes low, slowing down aluminum oxidation and making it difficult for electrons to transfer from Al to Cu due to the weak current. On the other hand, if the paste is too thick, OH^- ions struggle to move due to hindered ion mobility, and H_2 gas becomes trapped at the cathode (Cu), inhibiting the reduction process.

Keywords: eco-friendly battery, clam shells, calcium oxide (CaO).