

ABSTRACT

CNDs (Carbon Nano-dots) nanomaterials are materials that can be used as materials in various promising application fields, including ceramic materials, semiconductor materials and composite reinforcement. CNDs can be synthesized from organic raw materials. One of the basic organic ingredients is pineapple and green mussel shells. Pineapple is used as a raw material because it contains the enzyme bromelin. While green mussel shells have a chitin content of around chitin 14%-35%. This research aims to synthesize and characterize CNDs utilizing pineapple and green mussel shells as environmentally friendly thermoelectric media. The research procedure used in this study is the process of isolating bromelin enzyme from pineapple, the process of isolation of kitni, and the process of characterizing CNDs. The variation of the study was by comparing the enzymes of bromelin, chitin and mocaf with variations of F1 (1: 1; 1), F2 (1:1:2), and F3 (1:2:1). Research on the synthesis and characteristics of CNDs carried out several tests, namely testing enzyme levels, chitin with FT-IR test, morphological test of CNDs (SEM test) and testing CNDs as thermoelectric media (I-V Meter test). The results of the identification of the initial preparation of the material showed a protein cadxar of 37.785 mg / ml with the highest enzyme activation of 1.021 U / gr. while the chitin FTIR test results from green clam shells have chitin functional groups, namely at wavenumbers 712.73 cm⁻¹ and 876.68 cm⁻¹ show the absorption of chitin, namely twisted N-H from amines (-NH₂). SEM EDX results show the morphology of F1, F2, and F3 is lumpy and uneven. Based on the results of I-V Meter characterization, the resistivity of the material ranges from 0.098 to 0.012 \square .cm. This research is expected to be a new alternative in making thermoelectric from pineapple and green mussel shells that can be used as environmentally friendly thermoelectric materials.

Keywords: *Nanomaterial (Carbon Nano-Dots), pineapple, green clam shell, thermoelectric*