



EFFECT OF AGING TIME AND STIRRING SPEED IN THE SYNTHESIS OF BIOGENIC HYDROXYAPATITE DERIVED FROM COCKLE SHELL

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Abstract

Cockle shell wastes are abundant, easily available and can be obtained at low cost. It is rich in calcium carbonate (CaCO_3) that can be precursor to synthesis hydroxyapatite (HAP). The HAP has potential to be used in numerous applications such as biomedical and wastewater treatment. The overall objective of this study is to determine the effect of reaction time and effect of stirring speed on the production of HAP derived from cockle shells waste. There are two reaction times used in this study which are 3 h and 5 h as well as two stirring speeds which are 500 rpm and 700 rpm. The processes involved in synthesizing the HAP were pretreatment of the cockle shells, production of CaCO_3 in aragonite form, calcination of the CaCO_3 to form CaO , production of Ca(OH)_2 and finally reaction of the Ca(OH)_2 solution with the phosphate source to obtain HAP. All samples have undergone physicochemical analyses to determine their crystallinity, purity, functional group, surface morphology and elemental analysis using X-ray diffraction (XRD), Fourier Transform Infrared Spectroscopy (FTIR), Scanning Electron Microscope (SEM) and Electron Dispersive X-ray Analysis (EDX). This study found that 5 h reaction time and 500 rpm stirring speed produced better HAP compared to the others. Overall, this study proved that reaction time and stirring speed play vital role in the quality of HAP.



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