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Hydroxyapatite Nanocrystals Synthesized from Calcium rich Bio-wastes

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Abstract

Hydroxyapatite nanocrystals were synthesized by wet chemical precipitation using bio-waste shells of mollusk (clam and mussel) and egg as feedstock materials. The powdered shells were calcined, dissolved in water, and the resulting product was reacted with phosphoric acid. X-ray diffraction analysis identified pure phase of hydroxyapatite for the three different raw materials. Transmission electron microscopy observations of hydroxyapatite indicated that rod-like crystals were produced in nanometric scale, which showed pH-dependent surface charges using zeta potential analysis. Overall, this study proved that calcium-rich bio-wastes are valuable materials to be used as feedstock for production of high purity and economically feasible hydroxyapatite nanocrystals for biomedical and technological applications.

Keywords: Hydroxyapatite; Eggshells; Mussel shells; Clam shells; Nanocrystals

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