

Synthesis and characterization of hydroxyapatite powder derived of eggshell by precipitation method

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Abstract : Hydroxyapatite is the inorganic material with formula $\text{Ca}_{10}(\text{PO}_4)_6(\text{OH})_2$. It is one of bioceramic was used for one repairs, fixing defects of filing voids in biomedical fields. The use of chicken eggshell is one of the natural sources to obtain the calcium phosphate compounds. The main objective of this study is to synthesize the hydroxyapatite by precipitation method from eggshell. The raw eggshell was calcined at 850°C for 2 hours following by grinding for 16 hours. The HA powder was synthesized by wet chemical method, using eggshells and phosphoric acid (H_3PO_4). X-ray diffraction spectroscopy (XRD, Scanning electron microscopy (SEM) and energy dispersive X-ray spectroscopy (EDS), Fourier-transform infrared spectroscopy (FTIR) were used to characterize the morphology, composition and distribution of the particles. The Thermos gravimetric analysis (TGA-DTA) was also carried out to evaluate the stability of the synthesized HA powder. The particle-size distribution (PSD) of the powder was determined by the laser scattering particle size distribution analyzer. The results showed that the sintered at 1000°C of HA powder resembles the feature of pure and single apatite phase having favorable Ca/P ratio.

Keywords : hydroxyapatite, Bioceramics, synthesis, Eggshell, Precipitation