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Wet Polymeric Precipitation Synthesis for Monophasic Tricalcium Phosphate

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Abstract : Tricalcium phosphate (β-Ca₃(PO₄)₂, β-TCP) powders were synthesized using wet polymeric precipitation method for the first time to our best knowledge. The results of X-ray diffraction analysis showed the formation of almost single a Ca-deficient hydroxyapatite (CDHA) phase of a poor crystallinity already at room temperature. With continuously increasing the calcination temperature up to 800 °C, the crystalline β-TCP was obtained as the main phase. It was demonstrated that infrared spectroscopy is very effective method to characterize the formation of β-TCP. The SEM results showed that β-TCP solids were homogeneous having a small particle size distribution. The β-TCP powders consisted of spherical particles varying in size from 100 to 300 nm. Fabricated β-TCP specimens were placed to the bones of the rats and maintained for 1-2 months.

Keywords : Tricalcium phosphate (β-Ca3(PO4)2, bone regeneration, wet chemical processing, polymeric precipitation
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