



No. 1, 1385/2006 Spring & Summer



Crystallography and morphological study of synthesized hydroxyapatite nano-particles

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(Received:17/2/2005, received in revised form: 11 /12/2005)

Abstract: Hydroxyapatite (HA), which is represented by the formula $\text{Ca}_{10}(\text{PO}_4)_6(\text{OH})_2$, is one of the inorganic components of the hard tissues of living bodies such as bones, teeth, etc. HA is a calcium phosphate-based bioceramic, which has been used in medicine and dentistry for more than 20 years because of its excellent biocompatibility with human tissues. The precipitation process, considered here, can add orthophosphoric acid solution to a calcium hydroxide solution. The precipitated powder samples were examined by XRD, FTIR, SEM and FESEM (Field emission electron microscopy) methods. The results revealed that the final precipitated powder is HA and using SEM with high magnification showed that these HA consists of small rod-like particles. In addition, the morphology and size of the precipitated particles change during different stages of process. After drying, these nano-particles tend to form small agglomerates.

Keywords: *Nanomaterials, Bioceramics, Hydroxyapatite, Crystallography, Morphology, Precipitation.*