

## Abstract

Hydroxyapatite (HAP),  $\text{Ca}_{10}(\text{PO}_4)_6(\text{OH})_2$ , is a bioceramic which have application in bone substitute materials. It is similar to the mineral phase of human bone. The preparation of hydroxyapatite powders or films with controlled morphology, stoichiometry, crystallinity and particular size in the nanometer range has the main role in production of materials. It depends on the precursors, solvent and temperature. Chelating agents (ethylenediamine tetra-acetic acid, EDTA, acid and sodium salt) have been used to prepare inorganic powders by sol gel process. We have investigated the effect of nature EDTA (acid or sodium) on the composition, structure and morphology of hydroxyapatite nanocrystals. It is found that EDTA plays an important role in synthesis of final HAP nanostructures. The samples were studied by X-ray powder diffraction analysis (XRD), infrared spectroscopy (IR) and scanning electron microscopy (SEM). The results showed that the carbonate substitution occurred in the phosphate sites increased in the case of HAP-EDTA sodium, which is expected to improve the bioactivity, the solubility and the osteo-integration