

عنوان مقاله:

Preparation and characterization of F-substituted hydroxyapatite nanopowders using new simple precursor via mechanochemical activation

محل انتشار:

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نویسنده:

خلاصه مقاله:

The present investigation reports on a novel precursor used for fabricating the F-substituted hydroxyapatite. The synthesis of nanostructured fluorapatite (FA; $\text{Ca}_{10}(\text{PO}_4)_6(\text{OH})_{2-x}\text{F}_x$) was explored from the starting materials of CaCO_3 , P_2O_5 and CaF_2 via a mechanochemical process. The products, which were prepared by different times of milling (10 min, 2, 4, 6, 8, 10, 12 and 14 h) and different contents of fluorine ion (0, 25, 50, 75 and 100 percent of substitution), were characterized by X-ray diffraction (XRD), scanning electron microscopy (SEM), Transmission electron microscopy (TEM) techniques and Fourier transform infrared (FTIR) spectroscopy. Transmission electron microscopy (TEM) analysis demonstrated that FA nanoparticles with an average diameter of about 15-30 nm were prepared. This is in agreement with XRD patterns. By this new precursor, nano bio ceramics synthesized very comfortable. Byproduct of this reaction was just CO_2 . Then purity of products was increased by using CaCO_3 . Also smaller nano bio ceramics with narrower particle size distribution can be made by using this method and novel and cheap precursor. The high productivity of the procedure opens a window to produce commercial plenty of fluorapatite nanoparticles

کلمات کلیدی:

ceramics, mechanochemical processing, nanofabrications, scanning electron microscopy, transmission electron microscopy, X-ray diffraction

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