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Synthesis and physicochemical characterization of hydroxyapatite HAP nanoparticles

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Over the last ten years, significant research efforts are focused on the development of the nanoparticle hydroxyapatite (HAP). This biomaterial is used widely as dental filler material, bone graft substitutes in orthopedic applications, hard tissue paste and tissue engineering. The research works has been directed toward the control of the composition, the morphology, and the physico-chemical properties in order to obtain biocompatible biomaterials. However, the difficulty is limited by the synthesis of hydroxyapatite nanoparticle as a pure compound; the reduction of particle size from micro to nano level also significantly improves their biological activities. In this study, we were interested in preparing a pure phase, crystalline HAP with required morphologies and particle sizes under our experimental conditions. The effects of the mode of preparation, duration of aging, calcinations temperature, pH and concentration of precursors are investigated. The prepared samples are characterized by Fourier transform infrared (FTIR), X-ray diffraction (XRD), Transmission electron microscope (TEM), IR and TEM. Nanohydroxyapatite was successfully synthesized by sol gel method and result conforms functional groups like (-OH) and presence of a phosphate group. The XRD patterns reveal that hydroxyapatite is a major phase presented in samples. The crystallite size of the HAP nanoparticles increased with the temperature.

Biography

Djalila Boudemagh is an Associate Professor at the University Ferhat Abbas of Setif. In 2010, she completed her PhD in Material Physics at University of Grenoble, France. Her research activities are focused on the conception, characterization, and evaluation of the behavior of pharmaceutical compositions able to improve the efficiency and/or decrease the side effects of pharmaceutical drugs.

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