

Cr³⁺/SiO₄⁴⁻ Codoped Hydroxyapatite Nanorods: Fabrication and Microstructure Analysis

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Abstract : In this study, nanorods of Cr³⁺/SiO₄⁴⁻ codoped hydroxyapatite (Cr³⁺/SiO₄⁴⁻-HA) were synthesized successfully and rapidly through microwave irradiation technique, using (Ca(NO₃)₂•4H₂O), ((NH₄)₂HPO₄), (SiC₈H₂₀O₄) and (Cr(NO₃)₃•9H₂O) as source materials for Ca²⁺, PO₄³⁻, SiO₄⁴⁻ and Cr³⁺ ions, respectively. The impact of dopants on the phase formation and microstructure of the powders were investigated by means of X-ray diffraction (XRD), Fourier transform infrared spectrum analysis (FT-IR) and Field emission electron microscopy (FESEM) techniques. XRD analysis showed that with an incorporation of Cr³⁺/SiO₄⁴⁻ ions into HA structure resulted in peak broadening and reduced peak height due to the amorphous nature and reduced crystallinity of the resulting HA powder. FTIR spectroscopy revealed the existence of the different vibrational modes matching to phosphates and hydroxyl groups. The FESEM analysis showed a change in the crystal shape from spherical to rod shaped particles upon Cr³⁺ doping into the crystal structure. Acknowledgments: This study was supported by Karabük University (Project no. KBÜBAP-17-YD-144). The authors would like to thank for support.

Keywords : nano-hydroxyapatite, microwave, dopants, characterization, microstructure

Conference Title : ICNNN 2017 : International Conference on Nanobiotechnology, Nanodevices and Nanodrugs

Conference Location : Rome, Italy

Conference Dates : July 17-18, 2017