## Cr³+/SiO<sub>4</sub>⁴- Codoped Hydroxyapatite Nanorods: Fabrication and Microstructure Analysis

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**Abstract :** In this study, nanorods of  $Cr^{3+}/SiO_4^{4-}$  codoped hydroxyapatite  $(Cr^{3+}/SiO_4^{4-}-HA)$  were synthesized successfully and rapidly through microwave irradiation technique, using  $(Ca(NO_3)_2 \cdot 4H_2O)$ ,  $((NH_4)_2HPO_4)$ ,  $(SiC_8H_{20}O_4)$  and  $(Cr(NO_3)_3.9H_2O)$  as source materials for  $Ca^{2+}$ ,  $PO_4^{3-}$ ,  $SiO_4^{4-}$  and  $Cr^{3+}$  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  $Cr^{3+}/SiO_4^{4-}$  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  $Cr^{3+}$  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

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