

Synthesis and Characterization of Magnesium and Strontium Doped Sulphate-Hydroxyapatite

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Abstract : Magnesium (Mg^{2+}), strontium (Sr^{2+}) and sulphate ions (SO_4^{2-}) were successfully substituted into hydroxyapatite ($Ca_{10-x-y}Mg_xSr_y(PO_4)_6-z(SO_4)_z(OH)_2-z$) structure through ion exchange process at cationic and anionic sites. Mg^{2+} and Sr^{2+} ions concentrations were varied between (0.00-0.10), keeping concentration of SO_4^{2-} ions at $z=0.05$. $[Mg(NO_3)_2]$, $[Sr(NO_3)_2]$ and (Na_2SO_4) were used as Mg^{2+} , Sr^{2+} , and SO_4^{2-} sources respectively. The synthesized white precipitate were subjected to heat treatment at $500^\circ C$ and finally characterized by X-ray diffraction (XRD) and Fourier Transform infra-red spectroscopy (FTIR). The results showed that the substitution of Mg^{2+} , Sr^{2+} and SO_4^{2-} ions into the HA lattice resulted in an increase in the broadness and reduction of XRD peaks. This confirmed that the crystallinity was reduced due to the substitution of ions. Similarly, FTIR result showed the effect of substitution on phosphate bands as well as exchange of hydroxyl group by SO_4^{2-} ions to balance the charges on HA surface.

Keywords : hydroxyapatite, substitution, characterization, XRD, FTIR

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