

Hafnium and Samarium Hydroxyapatite Composites and Their Characterization

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Abstract : Nowadays, the bioceramic graft applications are very important due to the fact that especially European population is getting much older. Consequently, healing approaches for some health problems become more important in the near future. For instance, osteoporosis is one of the reasons for serious hip fractures. Beside these, the traffic accidents playing role increasing of various hip fractures and other bone fractures. Naturally all these are leading the importance developing new bioceramic graft materials. Hydroxyapatite (HA) is one of the leading bioceramics on the market. Beside the high biocompatibility HA bioceramics unfortunately are weak materials for loaded areas. For improvement mechanical properties of HA material, some oxides and metallic powders can be added. In this study, some rare earth oxides like hafnium (IV) oxide (HfO_2) and samarium (III) oxide (Sm_2O_3) are added to HA for improvement of their material characteristics. Thus, compression, microhardness and theoretical density tests are performed. X-ray diffraction patterns are also investigated corresponding x-ray diffraction equipment. At the end, studies of scanning electron microscope (SEM) and energy-dispersive x-ray spectroscopy (EDX) are completed. All values were compared with past BHA and various composites.

Keywords : biocomposite, hafnium oxide, hydroxyapatite, nanotechnology, samarium oxide

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