

Fabrication and mechanical properties of doped-hydroxyapatite composite.

Thursday, May 21, 2015 1:00 PM (3h 30m)

Ionic substitutions in hydroxyapatite (HA) have been extensively studied to improve its biological and/or mechanical properties. This work aimed to prepare and characterize the composite of polycaprolactone (PCL) and Zn-doped, Sr-doped or Zn/Sr-codoped HA. The doped HA nanoparticles were first prepared via a sol-gel method. XRD and FTIR results of the calcined powder showed that HA is the main phase, with β -TCP as the second phase and chemical composition is accordance to other public data. To prepare the composite, the doped HA and PCL powders were mixed at the ratios of 3:7, 4:6, 5:5 and 6:4, and then compressed into a disc shape using an uniaxial hydraulic pressing technique. The specimens were then subjected to a compression test. Young's modulus was found to increase as the HA content increased. The composites with the 6:4 Sr-doped HA/PCL ratio have the values of compressive modulus of 16.26 GPa and compressive strength of more than 160 MPa which are close to those of compact bones.

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Session Classification: Poster-3

Track Classification: Material Physics, Nanoscale Physics and Nanotechnology