

## **Porous hydroxyapatite scaffold nanostructured for potential application in drug delivery system**

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Hydroxyapatite (HAP) is a calcium phosphate used for many years in biomedicine as a bone substitute. It is biocompatible, osteoconductive and has excellent chemical and biological affinity with bony tissues[1]. Besides HAP has been used successfully as porous scaffolding materials for graft. One attractive of these scaffolds is the possibility of being a host for different materials such as drugs, nanoparticles, biomolecules[2]. In this work porous scaffold HAP with two different pores size was made using a sacrificial template of silica spheres, to create a nanostructure material for drug delivery system. The Stöber[3] method was used to prepare silica spheres, which were dispersed in ethanol and left to dry under gravitational sedimentation in order to obtain the template. For the porous scaffold the HAP prepared by a sol-gel route was infiltrated into the silica template, and after heat, the silica was removed. The silica spheres template were analyzed by X-ray powder diffraction (DRX), Infrared vibrational spectroscopy (IV) and scanning electron microscopy (SEM) results showed the successful preparation of two silica spheres template, one with spheres size of 200nm and another with spheres size of 400nm. The porous scaffolds HAP samples were analyzed by SEM and DRX, the results indicate HAP single phase were obtained and the silica was completely removed without destroying the hierarchical porous structure. The pores sizes of the samples were 170nm or 350nm depending on the template used. Therefore porous scaffolds HAP nanostructured were successfully obtained with potential for application in drug delivery system.

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