

Controlling the Surface Morphology of the Biocompatible Hydroxyapatite Layer Deposited by Using a Flame-Coating

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Abstract : A biocompatible layer is prepared from calcium phosphate, which plays a role in building damaged bones and is used in many applications. In this research, calcium phosphate is coated on stainless steel substrates (SS 316) by using the flame coating. FE-SEM images show that the behavior of the sample surfaces varies with distance, at 3cm, appeared with nanostructures of bumps shaped of diameter about 317 nm. The contents of the elements are analyzed by energy-dispersive X-ray spectroscopy (EDX). The chemical elements C, Ca, Fe, Ni, Cr, Mn and O corresponding to calcium phosphate and the alloy are revealed by EDX analysis of the coating layer. XRD patterns for the calcium phosphate layers indicate the formation of the Hap layer on the deposited layers. The samples are immersed in a solution of simulated body fluids (SBF) for 21 days to examine the biocompatibility, as the tests show that the calcium phosphate ratio of 1.65 is the appropriate and biocompatible ratio in the human body. The assays show antibacterial activity using the diffusion disk procedure. On the surface of the agar, observed infested E.coli bacteria and incubated for 24 hours at 37°C. Bacteria grow on the entire agar rather than in some areas around some samples at a distance of 3 cm from the flame hole.

Keywords : biomaterial, flame coating, antibacterial activity, stainless steel

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