عنوان مقاله:

Influence of ZnO-Folic Acid Nanoparticles on the Bioactivity Property of Polycaprolactone in the Simulated Body Fluid

محل انتشار:

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خلاصه مقاله:

Among of biopolymers, polycaprolactone (PCL) is a good candidate for bone tissue engineeringand substitution of damage tissues due to its biodegradability, biocompatibility, low-cost,and accessibility [1]. In order to prevent the agglomeration of ZnO nanoparticles (NPs) in thepolymer matrix, in this study an attempt has been done to modify the surface of ZnO NPswith folic acid (FA) as a biosafe and biodegradable molecule. In the next step, ZnO-FA NPs(2, 5, and 8 wt %) were embedded in PCL. Fig. 1 shows the probable interactions betweenfiller and matrix. The sonochemical process as a safe, fast, and green method [2], was used forthe preparation of ZnO-FA NPs and PCL/ZnO-FA nanocomposite (NC) films. For characterizationof NC films, different methods like field emission scanning electron microscopy, thermogravimetricanalysis, UV-Visible spectroscopy, water contact angle, and transmission electronmicroscopy (TEM) were applied. TEM images showed good dispersion of NPs in thePCL matrix (Fig. 1). By increasing the amount of ZnO-FA NPs in the PCL matrix, the intensityof absorption peaks in the UV-Vis spectra was increased. Also, the in-vitro bioactivityevaluation of NCs showed the formation of the hydroxyapatite layers on the surface of thesecompounds in the simulated body fluid after 28 days.

کلمات کلیدی: