

عنوان مقاله:

A novel fabrication of PVA/Alginate-Bioglass electrospun for biomedical engineering application

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خلاصه مقاله:

Objective (s): Polyvinylalcohol (PVA) is among the most natural polymers which have interesting properties such as nontoxic nature, biodegradability and high resistance to bacterial attacks making it applicable for tissue scaffolds, protective clothing, and wound healing. Materials and Methods: In the current work, PVA and Na-Alginate nanocomposite scaffolds were prepared using the electrospinning (ELS) technique in an aqueous solution. Also, (5% and 10%) addition of bioglass (BG) ceramic to the nanocomposite scaffold were investigated. The blended nanofibres are characterized by scanning electron microscopy (SEM), Fourier-transform infrared (FTIR), also the bioactivity evaluation of nanocomposite scaffold performed in simulated body fluid (SBF) solutions. Results: The FTIR analysis indicated that PVA and Alginate may have H+ bonding interactions. The results revealed that with a higher amount of BG, a superior degradation as well as a higher chemical and biological stability could be obtained in the nanobiocomposite blend fibres. Furthermore, the blend nanofibre samples of 10% BG powders exhibit a significant improvement during bioactivity and mechanical testing. Conclusion: The increasing water-contact angle on the polymer surface with decreasing PVA and Alginate content indicated that the scaffold were more hydrophobic than were PVA molecules. Also, In addition, the average diameter of fibers in the sample with 10% BG have the highest porosity compared to the other scaffold samples.

کلمات کلیدی:

Alginate, Bioglass, Electrospinning, Polymer, Tissue engineering

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