

Название публикации:

New Fibrous Materials Based on Poly-3-Hydroxybutyrate for Biomedical Purposes, Made via Electrospinning Technique

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Аннотация:

An effect of small concentrations of nanosized titanium dioxide and silicon particles exerted on the formation of the supramolecular structure of poly-3-hydroxybutyrate fibers is studied. The fibers were obtained by means of electrospinning from a poly-3-hydroxybutyrate solution in chloroform. The structure of fibrous materials is studied by means of DSC, ESR, SEM, and physicomechanical testing. It is established that the fibers have intercrystalline areas with different ordering level. Using a small concentration of nanosized titanium dioxide and silicon particles leads to a slowing down of crystallization processes and to a decrease in the activation energy of the phase transition of PHB fiber melting. At the same time, the average fiber diameter decreases and the packing density increases. The obtained bioresorbable matrices can be successfully used in biomedicine for growing various connective and integumentary tissues of an organism.

Ключевые слова:

bioresorbable matrices, crystallization, electrospinning, fibers, nanoparticles, poly-3-hydroxybutyrate, silicon, titanium dioxide, Activation energy, Chlorine compounds, Crystallization, Fibers, Materials testing, Nanoparticles, Oxides, Silicon, Silicon compounds, Spinning (fibers), Titanium, Titanium dioxide, Average fiber diameters, Bioresorbable, Crystallization process, Electrospinning techniques, Nano-sized titanium dioxide, Poly-3-hydroxybutyrate, Small concentration, Supramolecular structure, Electrospinning