

Название публикации:

Poly(3-Hydroxybutyrate) Matrices Modified with Iron(III) Complexes with Tetraphenylporphyrin. Analysis of the Structural Dynamic Parameters

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Аннотация:

The effect of small additions of the iron(III) complex with tetraphenylporphyrin (0–5%) on the structure and properties of ultrathin fibers based on poly(3-hydroxybutyrate) (PHB) was studied by differential scanning calorimetry (DSC), X-ray diffraction analysis (XRD), EPR probe method, and scanning electron microscopy. When tetramethylporphyrin was added to the PHB fibers, the crystallinity significantly increased, and the molecular mobility in the amorphous regions of the polymer decreased. The thermal treatment of the fibers (annealing at 140°C) led to significantly increased crystallinity and decreased molecular mobility in the amorphous regions of the PHB fibers. The addition of tetramethylporphyrin to the PHB fibers led to a sharp decrease in crystallinity. Ozonolysis of the fibers at small treatment times caused a considerable decrease in their molecular mobility (to 5 h), while prolonged ozonolysis led to increased mobility. The obtained fibrous materials have bactericidal properties and will find use in the development of antibacterial and antitumor therapeutic systems. © 2018, Pleiades Publishing, Ltd.

Ключевые слова:

binary amorphous phase, correlation times, EPR method, oxidation with ozone, poly(3-hydroxybutyrate), stable TEMPO radical, thermal treatment, ultrathin fibers