# TUNING THE MECHANICAL PROPERTIES OF POLY(3-HYDROXYBUTYRATE)-BASED ELECTROSPUN MATERIALS

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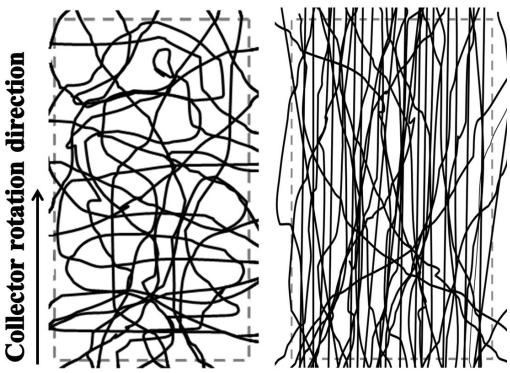
Recently, an abrupt increase in the number of studies on electrospun materials has been observed, since they possess specific properties related to their size (nanoscale diameters and a length of tens of meters and more) and their exceptionally large specific area. It is well known that the mechanical properties of the electrospun materials depend on diverse parameters. However, a key factor is the structure and the achievement of a certain alignment of the fibers that compose the non-woven textile during the electrospinning process.

Poly(3-hydroxybutyrate) (PHB) is worthy of special interest as promising biopolymer obtained from renewable resources. Because of its high crystallinity, PHB is stiff and brittle, and this results in very poor mechanical properties with a low extension at break, which limits its range of applications. In addition, it is known that the fibrous materials from PHB prepared by electrospinning by means of conventional collector are characterized by poor mechanical properties. In this respect, the present research is focused on study of the possibilities for improving the mechanical properties of PHB-based materials obtained by electrospinning using different types of patterned rotating collectors. A series of electrospun non-woven fibrous materials based on PHB with alignment structure and patterned architecture were obtained. The effect of the collector geometry and speed onto arrangement of PHB fibers was studied. The dependence of the crystallinity on the alignment and structure of electrospun PHB materials also were carried out. Moreover, the strength of the PHB materials obtained by electrospinning onto patterned collectors by measuring their mechanical behaviour at strain (tensile properties) was assessed. Thereby, the effect of the collector geometry and speed on the structure and mechanical properties of PHB-based non-woven textile is shown.

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