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# Self-supporting Electrospun PHB and PHBV/Organoclay Nanocomposite Fibrous Scaffolds

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## Abstract

Here we report the preparation of novel electrospun poly ( $\beta$ -hydroxybutyrate) (PHB) and poly(3-hydroxybutyrate-co-3-hydroxyvalerate) (PHBV)/organo-modified montmorillonite (OMMT) nanocomposite fibrous scaffolds. The incorporation of OMMT particles leads to significant amorphization of the deposited fibrous scaffolds and greatly improves the mechanical parameters. The addition of 5 wt. % OMMT in the 12 wt. % PHBV solution leads to predominant electrospinning and self-supporting 3D network fibrous scaffold formation. In the case of electrospun PHB mats, the addition of OMMT particles leads to significant reduction of average fiber diameter and formation of surface clay filled pore structure.

**Keywords:** Electrospinning, PHB, PHBV, Organoclay, Fibers, Nanocomposite scaffolds

## 1. Introduction

Polyhydroxyalkanoates (PHAs) are a class of natural aliphatic  $\alpha$ -polyesters produced by bacterial fermentation. The most known member of PHAs is poly ( $\beta$ -hydroxybutyrate), denoted PHB – a highly crystalline, biodegradable, biocompatible and brittle thermoplastic material. The high crystallinity of PHB is a consequence of its perfect stereoregularity and

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