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Fibres from blends of epoxidized natural rubber and polylactic acid by the electrospinning process: Compatibilization and surface texture.

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Abstract

Fibres were electrospun from blends of an epoxidized natural rubber (ENR) with a minor amount of a crystalline grade of polylactic acid (PLA), using a graft copolymer compatibilizer (ENR-g-JM) produced by reaction processing of a mixture of PLA and monoamine terminated polypropylene glycol (Jeffamine M600). The incorporation of PLA into the elastomer spinning solution in the form of a blend was necessary to obtain the required solution properties and to establish the appropriate operational conditions for the successful electrospinning of fibres. The addition of a small quantity of compatibilizer to the ENR/PLA blend reduced the severity of surface roughness of the fibres. Moreover, the use of monoamine terminated polypropylene glycol alone, as a plasticizer, was also found to exert a control on the development of surface texture during electrospinning. The rate of solvent induced crystallization in the swollen fibres jet was identified as the factor determining the surface topography.

Keywords: Blend; Compatibilization; Epoxidized natural rubber; Electrospinning; Jeffamine, Polylactic acid

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