

电纺制备PCL纳米纤维材料及其直径测量的修正方法

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摘要

电纺方法中纳米纤维材料在收集器表面因重力和黏性的作用横截面将从圆形变为椭圆形。定义AFM的测量结果为垂直直径, SEM的测量结果为水平直径, 研究了电压和浓度两个重要参数对电纺方法制备PCL纳米纤维平均直径的影响, 并得到了质量分数为10%的PCL溶液制备的纳米纤维、并且其水平直径为垂直直径的1.5倍。

关键词 [复合材料](#); [静电纺纱](#); [PCL纳米纤维](#); [AFM图像](#); [SEM图像](#); [纤维直径测量](#)

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Electrospun PCL nanofiber and its diameter measurement correction

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Abstract

Measurements of the electrospun polymer nanofibers showed that the fibers are not quite circular in section shape, they tend to be slightly flattened out at the top due to the effects of gravity and the surface viscosity between nanofiber and substrate, especially for the soft polymer nanofibers. Defining the diameter measured by AFM as vertical diameter, and that by SEM as horizontal diameter, the effects of two main parameters, applied electric voltage and polymer solution concentration, on the average diameter of the electrospun PCL nanofiber were studied. The quantitative relations between the horizontal and vertical diameters of the nanofibers electrospun by the PCL solution with the concentration of 10% were obtained, and the empirical formulas were derived. The results showed that the horizontal diameter of this fiber is about 1.5 times as the vertical diameter.

Key words [composite materials](#) [PCL nanofiber](#) [AFM image](#) [SEM image](#)

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