

Manufacture of Antibacterial Medical Dressings from Nanofibers Prepared by Electrospinning

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Abstract

Electrospinning has become a preferred method for manufacturing nanofiber membranes quickly and with minimal investment. In this study, polyacrylonitrile (PAN) was dissolved in dimethylformamide (DMF), and a specific weight ratio of polyvinylpyrrolidone (PVP) and gentamicin sulfate was added to the solution to manufacture nanofibers using the electrospinning process. Gentamicin was added to kill germs and bacteria resulting from exposure of the skin to outside air, while PVP was added to make the membrane surface hydrophilic to enhance the filtration rate and efficiency. The prepared samples were spun using a homemade electrospinning device at specific parameters, and the diameters of the spun nanofibers were calculated using a scanning electron microscope (SEM). The samples were analyzed using an infrared (IR) spectrometer, and then the biological effectiveness of the prepared medical dressings was tested on two types of bacteria, showing great effectiveness for use as medical dressings for skin wounds, especially after surgery.

Keywords

Electrospinning, nanofibers, polyacrylonitrile, medical dressings.