

전기방사된 나일론 66 부직포의 특성

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Characterization of Nylon 66 Non-woven via Electrospinning

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1. Introduction

The first developed engineering plastic and synthetic fiber, Nylon has been widely used because of its excellent properties. Recently, electrospinning has been gradually spotlighted as a different method of producing fibers, in which fibers of submicron can be consistently produced [1,2].

In this work, we have prepared nanofiber non-woven from Nylon 66 of which properties were investigated. The morphological properties of Nylon 66 non-woven was observed by SEM.

2. Experimental

2.1 Materials

Nylon 66 with a relative viscosity 2.7 was purchased from BASF Company Ltd. Nylon 66 was dissolved in a mixing solvent with formic acid and acetic acid of which ratios was 100/0~60/40 (v/v). The Nylon 66 solutions were prepared with weight concentration ranging from 10 to 20 %. Formic acid is a good solvent for Nylon 66 while acetic acid is a poor solvent for Nylon 66. All chemicals were used further purification.

2.2 Electrospinning technique

High voltage power supply (CPS-60 k02v1, Chungpa EMT, Co., Korea) was used to supply voltage in a range of 0-50 kV. Polymer solution was filled into the 5 ml syringe tip with 1 mm diameter and fixed at approximately 10 ° in the plane of the horizon. The applied voltage and tip-to-collector distance were 15 kV, 6 cm, respectively.

2.3 Characterization of electrospun fibers

The morphology of the resulting non-woven was examined with scanning electron microscopy (SEM, GSM-5900, JEOL. Co., Japan) after gold coating. The average diameter and the diameter distribution were obtained by using image analyzer (Image-proplus, Media Cybernetics Co., USA). Gas permeability was determined by using gas permeation analyzer (GPA-2001, B. S. Chem. Co. L td., Korea).

3. Results and discussion

Figure 1. shows a SEM image of electrospun Nylon 66 non-woven as a function of concentration.

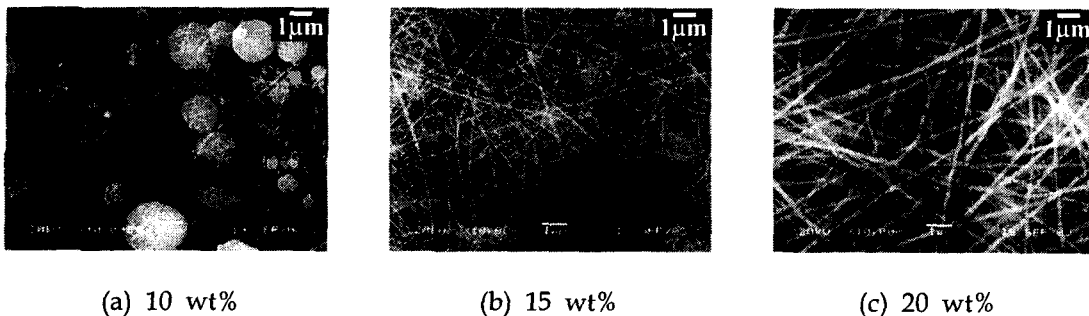


Figure 1. SEM Images of electrospun Nylon 66 non-woven as a function of concentration.

It was confirmed by SEM that electrospun non-woven had lots of spherical beads. With increasing concentration, the beads were reduced, and the shape of the spherical beads gradually changes into fibers. The average diameters of fibers were 100~200 nm. The gas permeability of non-woven mats showed unique behaviors depending on fiber diameter. According to this work, it was regarded that Nylon 66 could be characterized by its morphological investigation.

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5. Reference

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