

Thesis Title	Studies on Electrospun Nylon6-Chitosan Composite Nanofibers for Cu(II) Ion Adsorption
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Abstract

Nanofibers of Nylon6-chitosan composite with weight ratio of Nylon6 to chitosan between 5-25 wt. % were fabricated using electrospinning process. Nylon6-chitosan solutions were prepared by dissolving chitosan powder (5-25% weight ratio compared to Nylon6) into Nylon6 solution (20 wt. %) in formic acid. Nanofibers were prepared from Nylon6-chitosan solution using electrospinning process at a potential of 20 kV and a distance of 20 cm from nozzle to substrate. Morphology of the obtained nanofibers was investigated by scanning electron microscope. It was found that uniform nanofibers were obtained at low chitosan content (5-15 wt. %) while bead formation was found at higher chitosan content (20-25 wt. %). In addition, diameter of nanofibers was found to decrease with increasing chitosan content. The water absorption of nanofibers mats was investigated by water dynamic contact angle measurements. The results revealed that the increase of chitosan ratio enhanced the surface hydrophilicity of the composite nanofibers. The existence of chitosan and nylon6 in the range of 5-15 wt. % was confirmed by FTIR spectra peak at 2350 cm^{-1} , identifying its NH_2 functional group which was depicted the N-H band of amino group of chitosan. For Cu(II) adsorption testing, the 15 wt. % nylon6-chitosan were used with 1 ppm Cu(II) solution by varying adsorption time and concentration of Cu(II) in solution was determined by Atomic absorption spectrometer. The result showed that the adsorption capacity of $192.5\text{ mg}\cdot\text{g}^{-1}$ for Cu(II) ions per 1 g of nanofibers mat was saturated immersion in solution for 180 min.

Keywords: Adsorption/ Electrospinning/ Heavy Metal Ion/ Nylon6-chitosan Nanofiber