

PREPARATION AND PROPERTIES OF POLY (VINYL ALCOHOL) NANOFIBERS BY ELECTROSPINNING

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ABSTRACT

In the present contribution, ultrafine fibers were spun from poly(vinyl alcohol) (PVA)/water solution using a homemade electrospinning set-up. The effects of the concentration of polymer solution, spinning voltage, collection distance between the tip to target and the flow rate of the solution on the morphological appearance and average diameter of the as-spun PVA fibers were investigated. A more comprehensive and systematic understanding of process parameters of the electrospinning was obtained. In this experiment fibers with diameter ranging from 100 nm to 1000 nm were obtained. The results showed that the solution concentration significantly affected the morphology and diameters of the as-spun PVA fibers. Lower concentration tended to facilitate the formation of fibers with beads. With increasing solution concentration, the morphology was changed from beaded fiber to smooth and uniform fiber and the fiber diameter was increased. Spinning voltage also had an important influence on the diameters of fibers, while the collection distance slightly affected the diameters of fibers. Thinner fibers were received on the target with lower voltage applied on the nozzle. The flow rate affected the diameters and the dispersion of fibers. The effect on crystallinities by electrospinning was also discussed. The morphology of fibers electrospun from PVA was observed and analyzed by scanning electron microscopy (SEM).

Key words: electrospinning; nanofibers; poly(vinyl alcohol)