

Electrospinning Growth Parameters Dependent PVP: PC71BM Nanofiber Structure Characterizations and Modeling

ABSTRACT

As green materials, the organic nano-fiber membranes are very potential for diverse functional purposes. The growth parameters based fiber alignment; surface morphology and diameter are key attentions to control mechanical, structural, electrical, and optical properties. These physical aspects of nanofiber are diversified its practical significance in which control of growth techniques is vital. Electrospinning is a facile but pragmatic approach to adjust the growth process by regulating growth parameters. In this study, fabrication of spinning parameter preference to control the nanofiber shape, diameters, and crystalline property are investigated. Different % weight of PVP and PC71BM mixture solution for electrospinning are used in this study. It is observed that the average applied field and solution concentration of active materials are paramount to well-aligned uniform diameter nanofiber having better structure and crystalline properties. The scanning electron microscopic (SEM) study of nanofiber micrograph shows the diameter size of nanofiber and it is validated by Response Surface Model (RSM). A sharp peak of polymer fiber is shown by X-ray diffraction (XRD) that realizes worthy nano-crystalline property. The overall growth process is reinforced by validation from RSM analysis.