

Fabrication of nanofiber by centrifugal spinning for large-area nanofilter

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Nanofiber has large surface area proper for filtration, tissue engineering, and battery. Conventional technology for the production of nanofiber utilized electrospinning, which provides thin and uniform nanofibers. However, electrospinning has limitations such as slow production rate of 0.001–0.1 g/h and need of high voltage above 10 kV. Centrifugal spinning is an alternative method employing centrifugal force rather than electric field. It gives high production rate and does not need electrically conductive target, high voltage, and special equipment. We produced poly(methyl methacrylate) and polystyrene nanofibers with a production rate of 2 g/h which is order of magnitude higher than electrospinning. We also fabricated large-area nanofilter with an area of 100 cm² by traditional Korean paper production-inspired method. The prepared nanofibers were dispersed in water with surfactant, and the dispersion was filtrated by mesh to remove water. After drying, the large-area nanofilter was successfully prepared. Fabricated nanofilter was characterized by TSI-8130, an automated filter efficiency analyzer.