

Surface Morphology of Polystyrene Fibers Electrospun from Non-volatile Solvent

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We produced a unique morphology on the surface of electrospun polystyrene fibers using a non-volatile solvent, *N,N*-dimethyl formamide (DMF), which is quite different from the porous structure observed on polymer fibers electrospun from volatile solvents such as tetrahydrofuran (THF). A unique, cucumber-like surface structure was obtained on the electrospun polymer fibers using relatively concentrated solutions (> 30 wt%). It is believed that the non-volatility of the solvent, the high viscosity of the polymer solution and the large diameter of the fiber retarded rapid evaporation of the solvent. Moreover, the residual solvent entrapped inside the fiber induced an extrusive force, which eventually yielded a unique surface structure such as small protuberances. We believe that this unique surface morphology would increase the surface area of the electrospun fibers and be able to control the wetting or the adsorption behavior.