

Abstract Submitted  
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**A new method for homogeneous and uniformly dispersed nanofiber composites using electrospinning** KENTARO WATANABE, ATSUSHI HOTTA, Department of Mechanical Engineering, Keio University — A method for the fabrication of a new type of homogeneous and well-dispersed nanofiber composite was introduced. Electrospinning can fabricate unwoven polymer nanofibers (NF) by electrostatic repulsion, which can be used for nano-filters and cell scaffolds. Polymer solution was put in a syringe and a high voltage was applied to the needle tip, while the polymer solution was ejected from the syringe toward a grounded metal plate (collector) to form unwoven NF. In order to make a nanofiber composite, the NF were then sandwiched by base polymers and molded. The traditional sandwich method would produce biased and relatively inhomogeneous composites. We therefore modified the metal plate to an optimized metal container that could contain polymer solution for the base composite material. This new method resulted in homogeneous mixing of NF that were ejected from the syringe to be directly included in the polymer solution. Polyvinylalcohol (PVA) was used for NF and polydimethylsiloxane (PDMS) was used for the polymer matrix. Field emission scanning electron microscopy (FE-SEM) revealed homogeneous and well-dispersed PVA NF in PDMS. The new method for the fabrication of homogeneous composites could be used for other combinations of polymeric NF and polymer matrix.

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