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Advanced Multi-Functional Nanofiber-Textile Materials for Chemical and Biological Protection Applications

Xiangwu Zhang

North Carolina State University, USA

Abstract

Electrospinning is a simple and versatile technique for producing nanofibers from various materials including polymers, composites, carbons, ceramics, and metals. This presentation focuses on the development of different functional nanofibers for protecting human from chemical and biological threats. Nanofiber mats have small fiber diameters and large surface areas, and hence they can significantly increase the filtration efficiency without sacrificing the air permeability. In addition, by introducing functional materials into nanofibers, it is also possible to provide electrospun nanofibers with antibacterial and detoxifying properties. However, electrospun nanofiber mats are typically weak and do not have good mechanical properties. Here, we present a novel approach for fabricating durable and functional electrospun nanofibers that are suitable for practical chemical and biological application.

Biography

Xiangwu Zhang, Associate Professor and University Faculty Scholar in the Department of Textile Engineering, Chemistry, and Science at North Carolina State University, joined the faculty in 2006. Zhang earned a B.S. in Polymer Materials and Engineering in 1997 and a Ph.D. in Materials Science and Engineering in 2001, both from Zhejiang University, China. Zhang has published two books, five book chapters, and more than 100 peer-reviewed journal articles. Zhang has also delivered over 160 presentations in international and national conferences.