World Academy of Science, Engineering and Technology
International Journal of Materials and Textile Engineering
Vol:13, No:05, 2019

Multifunctional Nanofiber Based Aerogels: Bridging Electrospinning with Aerogel Fabrication

Authors : Tahira Pirzada, Zahra Ashrafi, Saad Khan

Abstract : We present a facile and sustainable solid templating approach to fabricate highly porous, flexible and superhydrophobic aerogels of composite nanofibers of cellulose diacetate and silica which are produced through sol gel electrospinning. Scanning electron microscopy, contact angle measurement, and attenuated total reflection-Fourier transform infrared spectrometry are used to understand the structural features of the resultant aerogels while thermogravimetric analysis and differential scanning calorimetry demonstrate their thermal stability. These aerogels exhibit a self-supportive three-dimensional network abundant in large secondary pores surrounded by primary pores resulting in a highly porous structure. Thermal crosslinking of the aerogels has further stabilized their structure and flexibility without compromising on the porosity. Ease of processing, thermal stability, high porosity and oleophilic nature of these aerogels make them promising candidate for a wide variety of applications including acoustic and thermal insulation and oil and water separation.

Keywords : hybrid aerogels, sol-gel electrospinning, oil-water separation, nanofibers
Conference Title : ICAMS 2019 : International Conference on Aerogel Materials and Structures
Conference Location : Amsterdam, Netherlands
Conference Dates : May 14-15, 2019