

Accepted Manuscript

One-way Water Transport Fabrics with Hydrophobic Rough Surface Formed in One-step Electrospray

Hongjie Wang, Wenyu Wang, He Wang, Xin Jin, Jialu Li, Zhengtao Zhu

PII: S0167-577X(17)31824-4
DOI: <https://doi.org/10.1016/j.matlet.2017.12.066>
Reference: MLBLUE 23564

To appear in: *Materials Letters*

Received Date: 18 October 2017
Revised Date: 9 December 2017
Accepted Date: 15 December 2017

Please cite this article as: H. Wang, W. Wang, H. Wang, X. Jin, J. Li, Z. Zhu, One-way Water Transport Fabrics with Hydrophobic Rough Surface Formed in One-step Electrospray, *Materials Letters* (2017), doi: <https://doi.org/10.1016/j.matlet.2017.12.066>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



One-way Water Transport Fabrics with Hydrophobic Rough Surface Formed in One-step Electro spray

Hongjie Wang^a, Wenyu Wang^{a,*}, He Wang^a, Xin Jin^b, Jialu Li^a, Zhengtao Zhu^{a,c}

^aState Key Laboratory of Separation Membranes and Membrane Processes, School of Textiles, Tianjin Polytechnic University, Tianjin 300387, China

^bSchool of Materials Science and Engineering, Tianjin Polytechnic University, Tianjin 300387, China

^cDepartment of Chemistry and Applied Biological Sciences, South Dakota School of Mines and Technology, Rapid City, SD 57701, USA.

Abstract:

A one-way water transport (also called OWT) cotton fabric is prepared by depositing a thin layer of hydrophobic polymer microspheres/nanospheres formed during one-step electro spray on one side of the hydrophilic cotton fabric. Rough surface resulted from the deposited microspheres/nanospheres mainly contributes to the hydrophobicity of electro sprayed layer and the layer thickness plays an important role in determining the water transport ability. OWT ability is observed in the cotton fabric with the electro sprayed layer thickness between 11 μm to 26 μm ; when the layer is thinner than 11 μm or over 26 μm , the fabric shows a two-way or blocked water transport ability. This novel OWT fabric can be used in “smart” textiles for various applications.

Key words: surface modification, interfaces, one-way water transport, electro spray.

1. Introduction

Recently, fabrics with novel one-way water transport (OWT) property, which allow water to transfer spontaneously from the hydrophobic side to the hydrophilic side without extra energy cost while hinder water transport from the hydrophilic side, have been developed[1-3]. Three effective

Download English Version:

<https://daneshyari.com/en/article/8014805>

Download Persian Version:

<https://daneshyari.com/article/8014805>

[Daneshyari.com](https://daneshyari.com)