

# **Advances in Multi-Functional Materials Symposium & NTC Forum 2010**

**Greenville, South Carolina, USA  
12 – 14 September 2010**

**ISBN: 978-1-61782-355-8**

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



**Some format issues inherent in the e-media version may also appear in this print version.**

Copyright© (2010) by the American Association of Textile Chemists and Colorists  
All rights reserved.

Printed by Curran Associates, Inc. (2011)

For permission requests, please contact the American Association of Textile Chemists and Colorists  
at the address below.

American Association of Textile Chemists and Colorists  
P. O. Box 12215  
Research Triangle Park, NC 27709

Phone: (919) 549-8141  
Fax: (919) 549-8933

[www.aatcc.org](http://www.aatcc.org)

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2634  
Email: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

# TABLE OF CONTENTS

<b>Textile Based Flexible Electroluminescent Devices</b> .....	1
<i>Paul Calvert</i>	
<b>Electronics Anywhere</b> .....	29
<i>Jeff Carbeck</i>	
<b>Using Nanofibers to Create Innovative Multifunctional Textiles</b> .....	45
<i>Melinda Camahan</i>	
<b>New Perspectives on Clothing for Health and Well-Being</b> .....	51
<i>Katherine Carroll</i>	
<b>R&amp;D Initiatives: Nuclear Radiation-Blocking, Anti-Chemical, Biological Protection Systems</b> .....	68
<i>Ronald DeMeo</i>	
<b>Effects of Cellulose Nanocrystal Addition to Alginate Fiber Nanocomposites</b> .....	69
<i>Christopher Kitchens</i>	
<b>Novel Nanofibers for Chemical and Biological Protective Clothing</b> .....	92
<i>Maran McCord</i>	
<b>Testing and Selecting Gloves for Cut Protection</b> .....	112
<i>Jeffrey Moreland</i>	
<b>Nanofibrous Membranes for Enhanced Human Protection</b> .....	127
<i>Kay. S. Obendorf</i>	
<b>Fibrous Materials for Oil Spill Applications</b> .....	134
<i>Seshadri Ramkumar</i>	
<b>Fascinating Carbon Nanotube Morphologies: Function Follow Shape</b> .....	161
<i>Apparao M. Rao</i>	
<b>Improvised Explosive Device (IED): Flash-Fireball Protection System Level Testing</b> .....	195
<i>James Reuther</i>	
<b>Fiber-based Scaffolds for Tissue Regeneration</b> .....	227
<i>Ken Webb</i>	
<b>Surface Modification of Fibrous Materials</b> .....	268
<i>Bogdan Zdyrko</i>	
<b>US Army Current and Future Ballistic Materials Needs</b> .....	291
<i>James Zheng</i>	
<b>Author Index</b>	