

American Institute of Chemical Engineers

# Polymers for Energy Applications

Topical Conference at the  
2007 AIChE Annual Meeting

November 4-9, 2007  
Salt Lake City, Utah, USA

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

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571  
[www.proceedings.com](http://www.proceedings.com)

ISBN: 978-1-60423-835-8

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

ISBN: 978-1-60423-835-8

Copyright (2007) by the American Institute of Chemical Engineers.  
All rights reserved.

For permission requests, please contact the American Institute of Chemical Engineers at the address below.

American Institute of Chemical Engineers  
Proceedings  
Three Park Avenue  
New York, NY 10016-5991  
Phone: 212-591-8100

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

American Institute of Chemical Engineers

Polymers for Energy Applications

## TABLE OF CONTENTS

<b>Copolymers of Aromatic Polyimides and Ionic Liquid for CO<sub>2</sub>/H<sub>2</sub> Membranes .....</b>	1
<i>P. Li, M Coleman, J. L. Anderson</i>	
<b>Hydrogen Sulfide and Carbon Dioxide-Selective Membranes for Fuel-Cell Fuel Processing.....</b>	2
<i>H. Bai, J. Huang, and W. Ho</i>	
<b>Acid Functionalized Ets-10 for Improved Proton Conductivity.....</b>	3
<i>J. J. Steirer Jr., Y. Yan</i>	
<b>Speek-Hydrotalcite Hybrid Conductive Membranes for Direct Methanol Fuel Cell (Dmfc) Applications .....</b>	4
<i>T. W. Kim, M. Sahimi, T. T. Tsotsis</i>	
<b>Fuel Cell Performance of Nano-Structured Sulfonated Polyimides .....</b>	5
<i>L. Zou, M. Anthamatten</i>	
<b>Water Sorption, Desorption and Transport in Nafion Membranes .....</b>	7
<i>J. B. Benziger, P. W. Majsztrik, M. B. Satterfield, A. B. Bocarsly</i>	
<b>New Membrane Morphologies for Pem Fuel Cells .....</b>	8
<i>P. N. Pintauro, R. Wycisk, J. Lin</i>	
<b>Multilayer Proton Exchange Membranes for Direct Methanol Fuel Cells .....</b>	9
<i>J. N. Ashcraft, A. A. Argun, P. T. Hammond</i>	
<b>Effects of Membrane Preparation and Treatment on Transport Properties in Recast Nafion® Membranes .....</b>	10
<i>N. W. DeLuca, Y. A. Elabd</i>	
<b>New Sulfonated Copolymer-Based Membranes for High Temperature Proton-Exchange Membrane Fuel Cells .....</b>	11
<i>H. Bai, W. Ho</i>	
<b>Tailoring the Structure of Composite Proton Conducting Membranes through Applied Electric Fields.....</b>	12
<i>D. Liu, X. Wei, M. Yates</i>	
<b>High-Throughput Water Uptake Characterization of Proton Exchange Membranes .....</b>	13
<i>K. Reed, C. Meredith</i>	
<b>Surface Energy Characterization of Gdls and Ionomer Membranes Using Inverse Gas Chromatography at Different Relative Humidity Conditions .....</b>	14
<i>D. J. Burnett, D. Wood, Y. Kim</i>	
<b>Rheology, Degradation, and Processing of Renewable Resource Polymer Blends .....</b>	16
<i>J. D. Conrad, G. H. Harrison</i>	
<b>Synthesis, Characterization, and Degradability Of Renewable Copolymers.....</b>	17
<i>M. D. Rowe, K. B. Walters</i>	
<b>Carboxylic Acid Functionalized Conducting Polymer Films for Sensing Applications.....</b>	18
<i>S. Vaddiraju, K. Seneca, M. C. Barr, D. Kusters, K. K. Gleason</i>	

<b>Highly Conductive Polymer Thin Films Realized by Field-Effect Charging.....</b>	19
<i>M. J. Panzer, C. D. Frisbie</i>	
<b>Vapor Deposition of Condensation Polymers for Organic Electronics .....</b>	20
<i>Z. I. Green, X. Chen, M. Anthamatten</i>	
<b>Morphology and Device Performance Of Bulk Heterojunction Solar Cells</b>	
<b>Optimized Via Solvent-Vapor Exposure .....</b>	22
<i>Y. Zhang, D. J. Mascaro</i>	
<b>Electronic Polymer Nanostructures and Devices Via Template Wetting</b>	
<b>Nanofabrication.....</b>	23
<i>S. A. Gold, S. Selmic, J. Cannon</i>	
<b>Author Index</b>	