

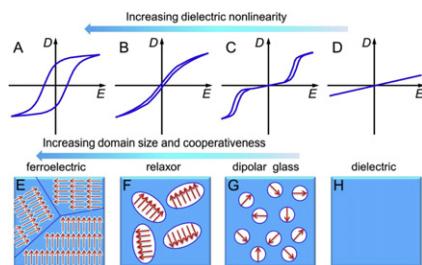
Polymer Vol. 54, No. 7, 22 March 2013

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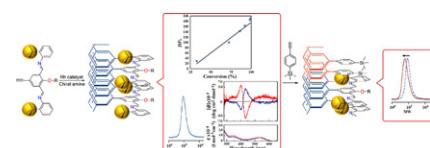
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Lianyun Yang<sup>a</sup>, Xinyu Li<sup>b</sup>, Elshad Allahyarov<sup>c,d,e</sup>, Philip L. Taylor<sup>c</sup>, Q.M. Zhang<sup>b,\*\*</sup>, Lei Zhu<sup>a,\*</sup><sup>a</sup> Department of Macromolecular Science and Engineering, Case Western Reserve University, Cleveland, OH 44106-7202, USA<sup>b</sup> Department of Electrical Engineering, Pennsylvania State University, University Park, PA 16802, USA<sup>c</sup> Department of Physics, Case Western Reserve University, Cleveland, OH 44106-7079, USA<sup>d</sup> Institut für Theoretische Physik, Heinrich-Heine-Universität Düsseldorf, D-40225 Düsseldorf, Germany<sup>e</sup> Theoretical Department, Joint Institute for High Temperatures, Russian Academy of Sciences, Izhorskaya 13/19, 117419 Moscow, Russia

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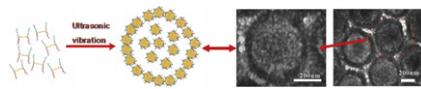
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The Key Laboratory of Space Applied Physics and Chemistry, Ministry of Education and Shanxi Key Laboratory of Macromolecular Science and Technology, School of Science, Northwestern Polytechnical University, Xi'an 710072, PR China

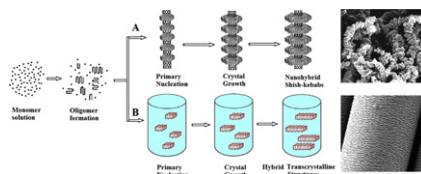


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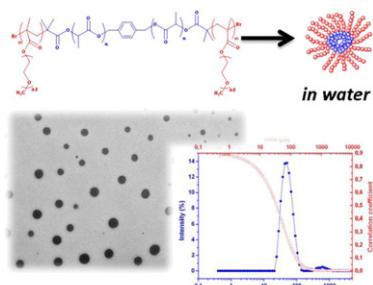
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<sup>b</sup>Laboratory of Applied Chemistry, Faculty of Science III, Lebanese University, P.O. Box 826, Tripoli, Lebanon



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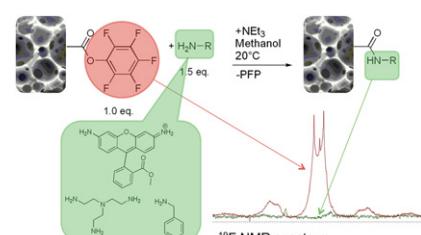
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Linda Kircher<sup>a,b</sup>, Patrick Theato<sup>b,c,\*\*</sup>, Neil R. Cameron<sup>a,\*</sup>

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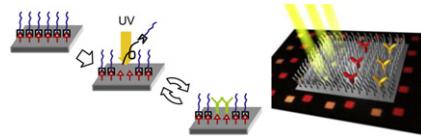
<sup>b</sup>Institute of Organic Chemistry, Johannes Gutenberg University Mainz, Duesbergweg 10–14, 55099 Mainz, Germany

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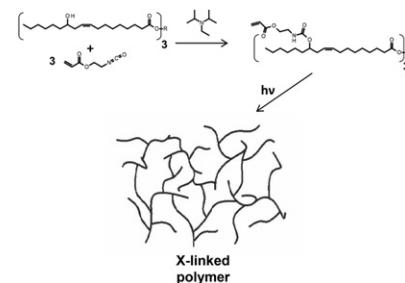
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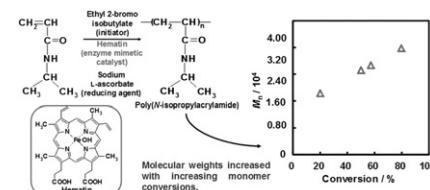


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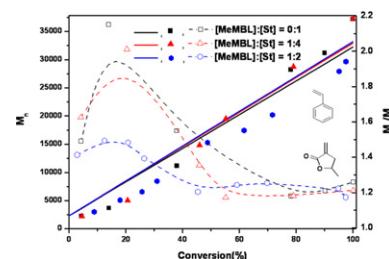


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The State Key Laboratory of Chemical Engineering, Department of Chemical and Biological Engineering, Zhejiang University, Hangzhou 310027, China



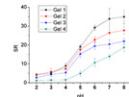
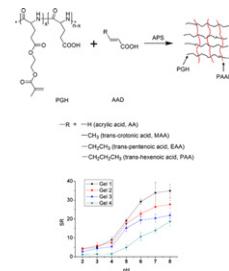
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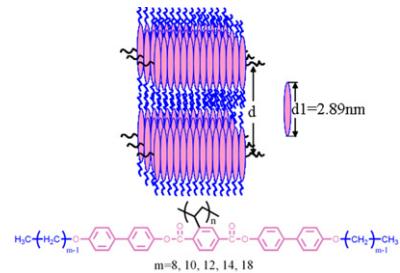


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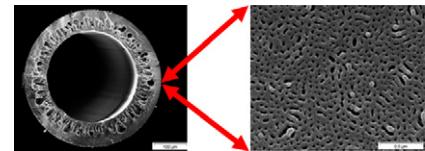


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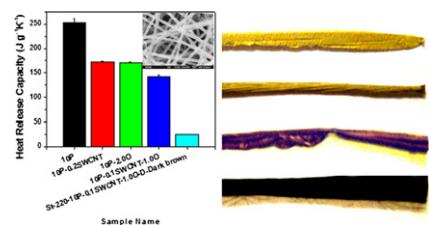


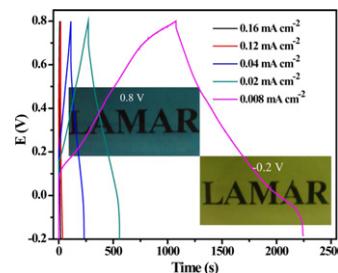
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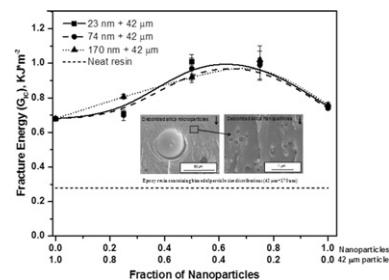
Polymer Science and Engineering Department, Silvio O. Conte National Center for Polymer Research, University of Massachusetts Amherst, Amherst, MA 01003, USA



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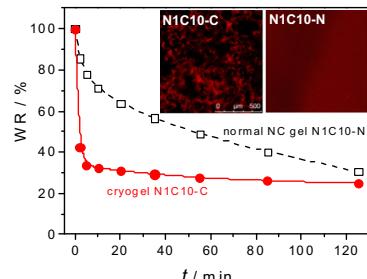
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Center for Polymer Science and Engineering, Lehigh University, 5 East Packer Avenue, Bethlehem, PA 18015, USA

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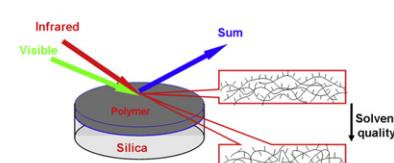
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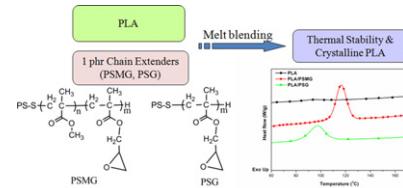
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Department of Chemistry, Key Laboratory of Advanced Textile Materials and Manufacturing Technology of Education Ministry, Zhejiang Sci-Tech University, Hangzhou 310018, China



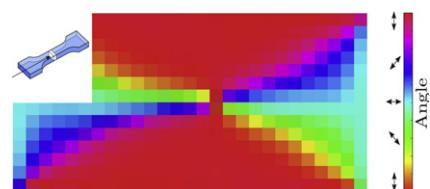
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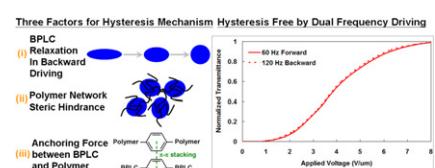
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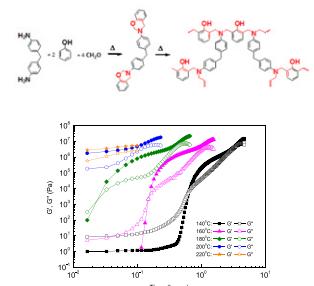
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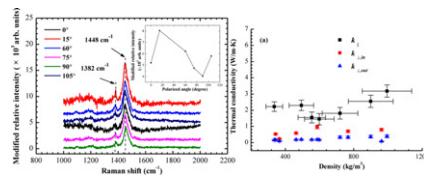
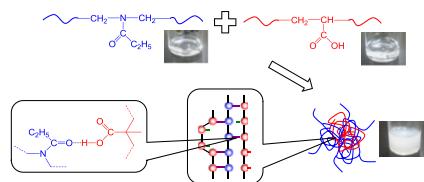
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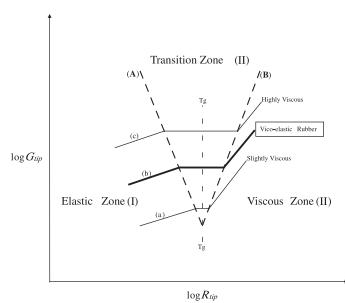
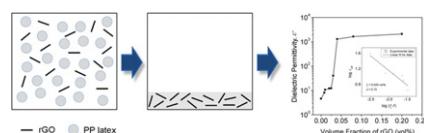
Department of Macromolecular Science and Engineering, Case Western Reserve University, Cleveland, OH 44106, USA



**3-dimensional anisotropic thermal transport in microscale poly(3-hexylthiophene) thin films****pp 1887–1895**Xuhui Feng<sup>a</sup>, Guoqing Liu<sup>a</sup>, Shen Xu<sup>a</sup>, Huan Lin<sup>a</sup>, Xinwei Wang<sup>a,b,\*</sup><sup>a</sup> Department of Mechanical Engineering, 2010 Black Engineering Building, Iowa State University, Ames, IA 50011, USA<sup>b</sup> School of Environmental and Municipal Engineering, Qingdao Technological University, Qingdao, Shandong 266033, PR China**Characterization of complexes formed by mixing aqueous solutions of poly(2-ethyl-2-oxazoline) and poly(methacrylic acid) with a wide range of concentrations****pp 1896–1904**Yasuhiro Matsuda<sup>a,\*</sup>, Kazumasa Takatsuki<sup>a</sup>, Yasunori Shiokawa<sup>a</sup>, Moriya Kikuchi<sup>b</sup>, Satoru Kidoaki<sup>c</sup>, Atsushi Takahara<sup>b,c</sup>, Shigeru Tasaka<sup>a</sup><sup>a</sup> Department of Materials Science and Chemical Engineering, Shizuoka University, 3-5-1 Johoku, Naka-ku, Hamamatsu 432-8561, Japan<sup>b</sup> Japan Science and Technology, ERATO, Takahara Soft Interface Project, 744 Motoooka, Nishi-ku, Fukuoka 819-0395, Japan<sup>c</sup> Institute for Materials Chemistry and Engineering, Kyushu University, 744 Motoooka, Nishi-ku, Fukuoka 819-0395, Japan**Elastic–viscous transition in tear fracture of rubbers****pp 1905–1915**

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Department of Materials, Queen Mary, University of London, Mile End Road, London E1 4NS, UK

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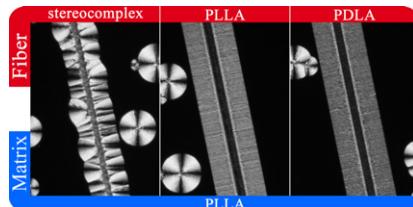
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<sup>b</sup> Beijing Key Laboratory of Clothing Materials R & D and Assessment, School of Materials Science & Engineering, Beijing Institute of Fashion Technology, Beijing 100029, China

<sup>c</sup> Purac Biochem B.V., Arkelsedijk 46, P.O. Box 21, 4200 AA Gorinchem, The Netherlands

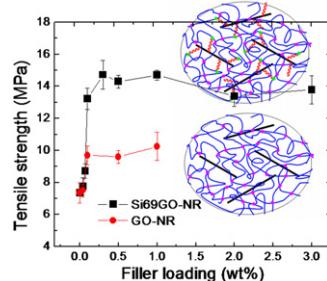
<sup>d</sup> Purac China, Building 3, Yuanshan Road #318, Minhang District, Shanghai 201108, China



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Jinrong Wu, Guangsu Huang\*, Hui Li, Siduo Wu, Yufeng Liu, Jing Zheng

College of Polymer Science and Engineering, State Key Laboratory of Polymer Materials Engineering, Sichuan University, Chengdu 610065, China

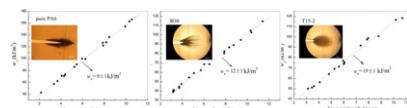


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 Sakulkaew, K. 1905  
 Shao, W. 1853  
 Shiokawa, Y. 1896  
 Silva, J. 1880  
 Sugiura, N. 1876  
 Takahara, A. 1896  
 Takatsui, K. 1896  
 Tasaka, S. 1896  
 Taylor, P. L. 1709  
 Teraguchi, M. 1729  
 Theato, P. 1755  
 Tian, W. 1734  
 Tong, Z. 1846  
 Tsai, C.-Y. 1876  
 Tsutuba, T. 1729  
 Vullum, P. E. 1867  
 Wang, C. 1846  
 Wang, C.-C. 1860  
 Wang, D. 1916, 1923  
 Wang, F. 1923  
 Wang, R. 1923  
 Wang, T. 1846  
 Wang, X. 1887  
 Wei, H. 1820  
 Wei, S. 1820  
 Wen, T. 1923  
 Wu, J. 1930  
 Wu, S. 1820, 1930  
 Xiao, C. 1786  
 Xie, B.-h. 1938  
 Xie, H.-L. 1794  
 Xiong, Z. 1923  
 Xu, S. 1779, 1887  
 Xu, X. 1853  
 Xu, Y. 1762  
 Yamamoto, K. 1775  
 Yamashita, K. 1775  
 Yang, L. 1709  
 Yang, M.-b. 1938  
 Yang, Z. 1734  
 Yin, B. 1938  
 Yotsuyanagi, H. 1729  
 Yu, J. 1853  
 Zang, Y. 1729  
 Zha, J.-W. 1916  
 Zhang, H.-L. 1794  
 Zhang, H.-T. 1734  
 Zhang, Q. M. 1709  
 Zhang, W.-B. 1734  
 Zhang, X. 1916, 1923  
 Zhao, J. 1916  
 Zheng, J. 1930  
 Zheng, S. 1846  
 Zhou, J. 1853  
 Zhou, Y. 1938  
 Zhu, J. 1820  
 Zhu, L. 1709  
 Zhuang, X. 1786