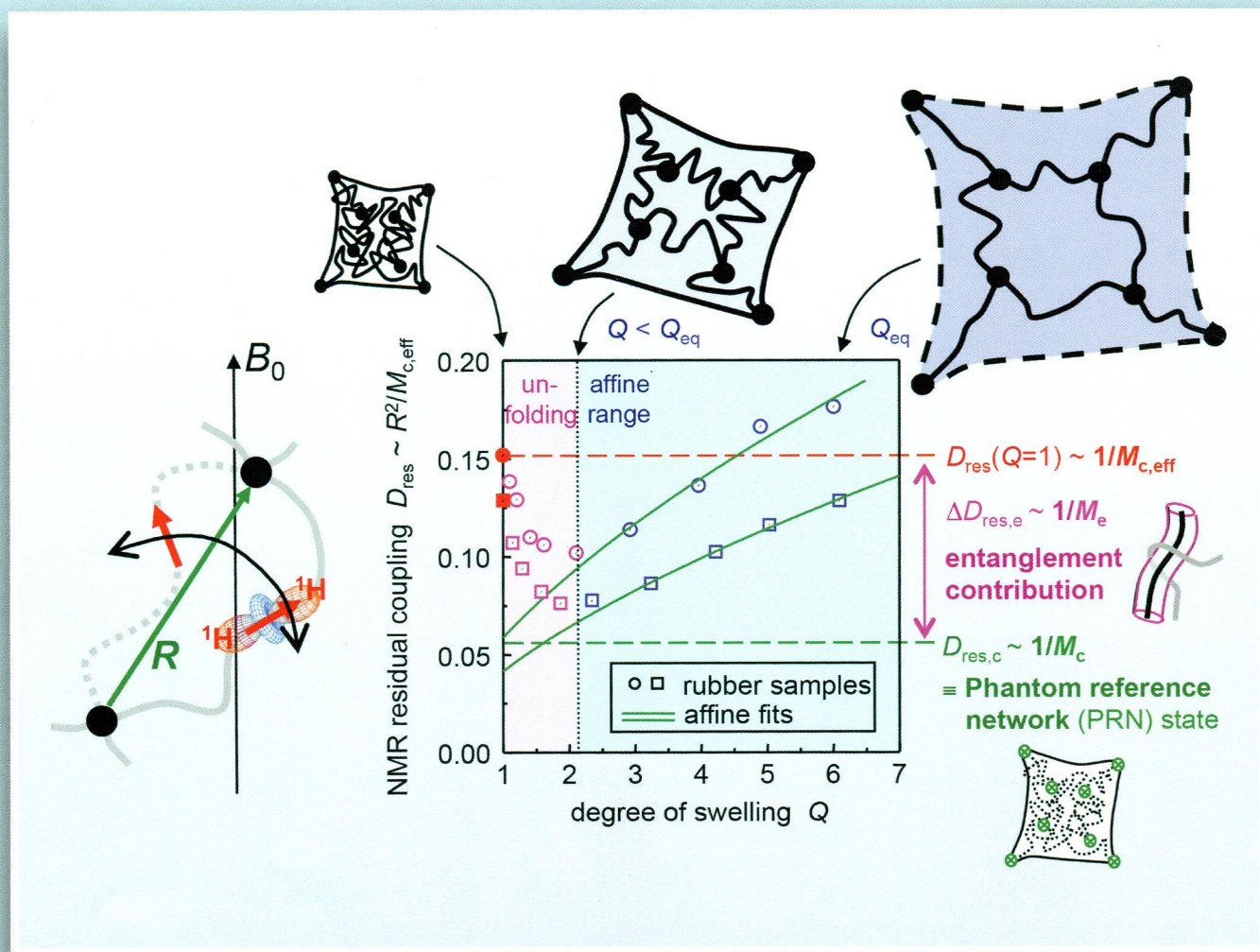


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Volume 47  
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# Macromolecules

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**ON THE COVER:** The average proton residual dipole–dipole coupling arising from anisotropic segmental motion in a fluctuating network chain provides an NMR measure of the inverse effective elastically active strand length, and a back-extrapolation over experiments performed at increasing degrees of swelling below equilibrium gives a measure of actual chain length free from entanglement effects. The latter can thus be quantified and compared with analyses of mechanical properties. See page 2759.

## Perspective

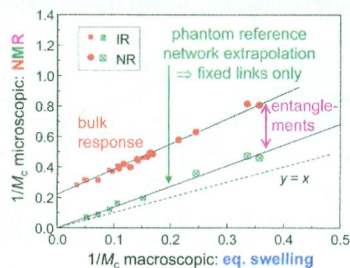
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dx.doi.org/10.1021/ma4026064

### Entanglement Effects in Elastomers: Macroscopic vs Microscopic Properties

Sandra Schlögl, Marie-Luise Trutschel, Walter Chassé, Gisbert Riess, and Kay Saalwächter\*



## Articles

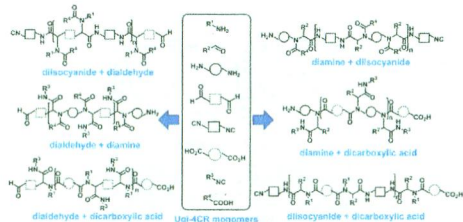
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dx.doi.org/10.1021/ma500504w

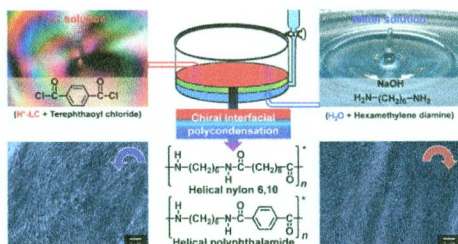
### Diversely Substituted Polyamides: Macromolecular Design Using the Ugi Four-Component Reaction

Ansgar Sehlinger, Patrick-Kurt Dannecker, Oliver Kreye, and Michael A. R. Meier\*



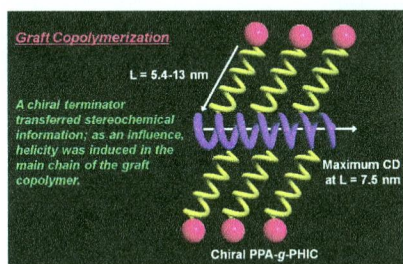
## Helical Nylons and Polyphthalamides Synthesized by Chiral Interfacial Polymerizations between Chiral Nematic Liquid Crystal and Water Layers

Jinwoo Park, Munju Goh, and Kazuo Akagi\*



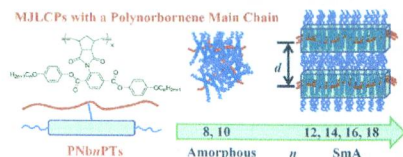
## A Model Chiral Graft Copolymer Demonstrates Evidence of the Transmission of Stereochemical Information from the Side Chain to the Main Chain on a Nanometer Scale

Priyank N. Shah, Chang-Geun Chae, Joonkeun Min, Ryotaro Shimada, Toshifumi Satoh, Toyoji Kakuchi, and Jae-Suk Lee\*



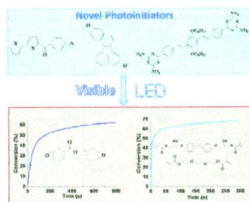
## Mesogen-Jacketed Liquid Crystalline Polymers with a Polynorbornene Main Chain: Green Synthesis and Phase Behaviors

Yu-Feng Zhu, Zhen-Yu Zhang, Qi-Kai Zhang, Ping-Ping Hou, De-Zhao Hao, Yang-Yang Qiao, Zhihao Shen,\* Xing-He Fan,\* and Qi-Feng Zhou



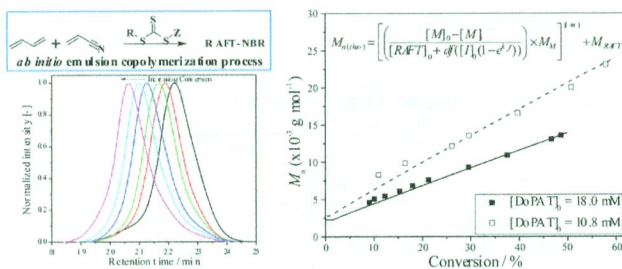
### Design of Novel Photoinitiators for Radical and Cationic Photopolymerizations under Near UV and Visible LEDs (385, 395, and 405 nm).

Jing Zhang, Michel Frigoli, Frédéric Dumur, Pu Xiao,\* Laura Ronchi, Bernadette Graff, Fabrice Morlet-Savary, Jean Pierre Fouassier, Didier Gigmes, and Jacques Lalevée\*



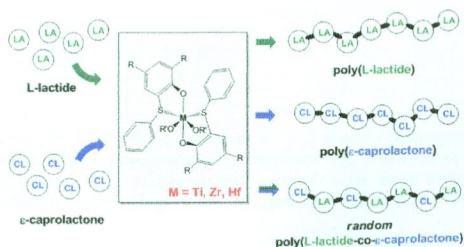
### RAFT-Mediated *ab Initio* Emulsion Copolymerization of 1,3-Butadiene with Acrylonitrile

Lebohng Hlaele, Dagmar R. D'hooge, Christoph J. Dürr, Andreas Kaiser, Sven Brandau, and Christopher Barner-Kowollik\*



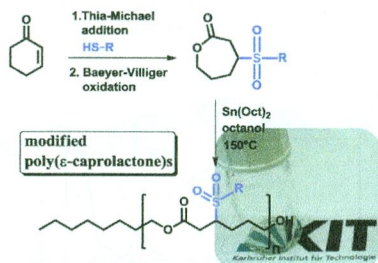
### Group 4 Metal Complexes Bearing Thioetherphenolate Ligands. Coordination Chemistry and Ring-Opening Polymerization Catalysis

Francesco Della Monica, Ermanno Luciano, Giuseppina Roviello, Alfonso Grassi, Stefano Milione,\* and Carmine Capacchione



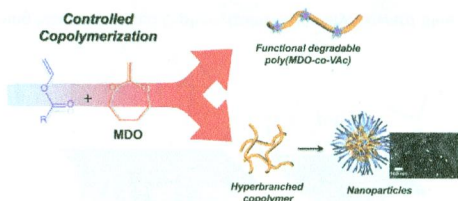
### Modified Poly( $\epsilon$ -caprolactone)s: An Efficient and Renewable Access via Thia-Michael Addition and Baeyer–Villiger Oxidation

Matthias Winkler, Yasmin S. Raupp, Lenz A. M. Köhl, Hanna E. Wagner, and Michael A. R. Meier\*



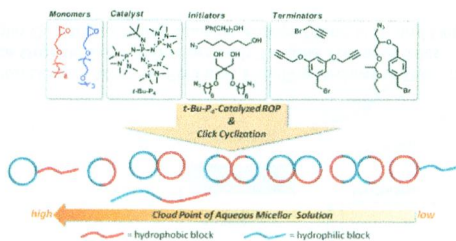
### Functional Degradable Polymers by Xanthate-Mediated Polymerization

Guillaume G. Hedir, Craig A. Bell, Nga Sze Leong, Emma Chapman, Ian R. Collins, Rachel K. O'Reilly,\* and Andrew P. Dove\*



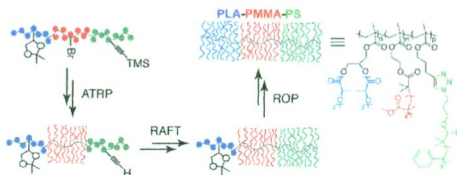
### Synthesis of Linear, Cyclic, Figure-Eight-Shaped, and Tadpole-Shaped Amphiphilic Block Copolyethers via $t$ -Bu-P<sub>4</sub>-Catalyzed Ring-Opening Polymerization of Hydrophilic and Hydrophobic Glycidyl Ethers

Takuya Isono, Yusuke Satoh, Kana Miyachi, Yougen Chen, Shin-ichiro Sato, Kenji Tajima, Toshifumi Satoh,\* and Toyoji Kakuchi\*

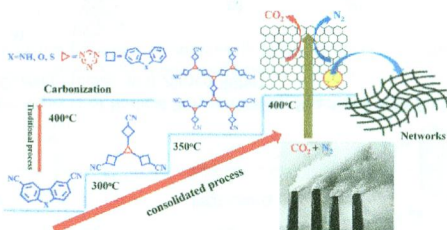


**Synthesis and Melt Self-Assembly of PS–PMMA–PLA Triblock Bottlebrush Copolymers**

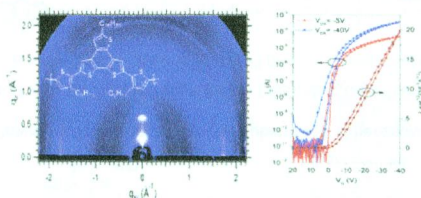
Justin Bolton and Javid Rzaevy\*

**Facile Preparation of Dibenzoheterocycle-Functional Nanoporous Polymeric Networks with High Gas Uptake Capacities**

Shaofei Wu, Yao Liu, Guipeng Yu,\* Jianguo Guan, Chunyue Pan, Yong Du, Xiang Xiong, and Zhonggang Wang\*

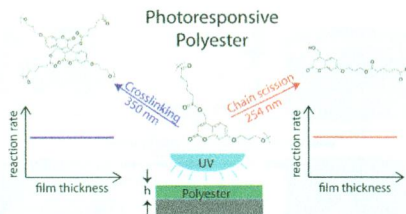
**Benzotrithiophene Copolymers: Influence of Molecular Packing and Energy Levels on Charge Carrier Mobility**

Bob C. Schroeder,\* Stephan Rossbauer, R. Joseph Kline, Laure Biniek, Scott E. Watkins, Thomas D. Anthopoulos, Iain McCulloch, and Christian B. Nielsen



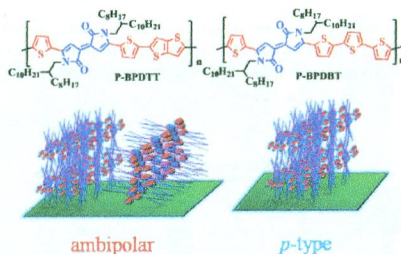
### Kinetics of UV Irradiation Induced Chain Scission and Cross-Linking of Coumarin-Containing Polyester Ultrathin Films

Jeongwoo Lee, Murthy V. S. N. Maddipati, Abraham Joy,\* and Bryan D. Vogt\*



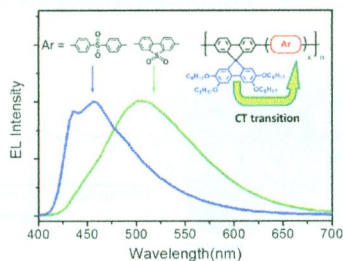
### Alternating Conjugated Electron Donor–Acceptor Polymers Entailing Pechmann Dye Framework as the Electron Acceptor Moieties for High Performance Organic Semiconductors with Tunable Characteristics

Zhengxu Cai, Hwei Luo, Penglin Qi, Jianguo Wang, Guanxin Zhang, Zitong Liu,\* and Deqing Zhang\*



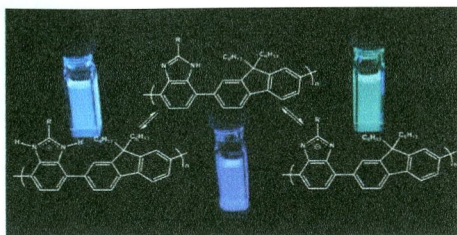
### Poly(spirobifluorene)s Containing Nonconjugated Diphenylsulfone Moiety: Toward Blue Emission Through a Weak Charge Transfer Effect

Xuchao Wang, Lei Zhao, Shiyang Shao, Junqiao Ding,\* Lixiang Wang,\* Xiabin Jing, and Fosong Wang



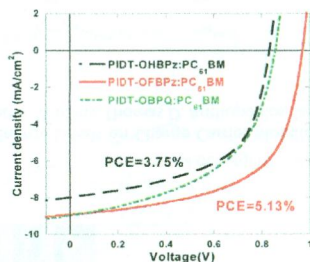
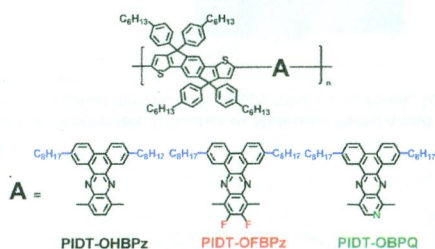
### Synthesis and Characterization of Poly(2-alkylbenzimidazole-*alt*-9,9-dihexylfluorene): A Dually Dopable Polymer System

Jared D. Harris, Charlotte Mallet, Cathrin Mueller, Carmen Fischer, and Kenneth R. Carter\*



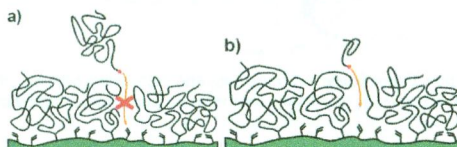
### Narrow-Band-Gap Conjugated Polymers Based on 2,7-Dioctyl-Substituted Dibenzo[*a,c*]phenazine Derivatives for Polymer Solar Cells

Ruifeng He, Lei Yu, Ping Cai, Feng Peng, Jin Xu, Lei Ying,\* Junwu Chen, Wei Yang,\* and Yong Cao



### "Grafting Through": Mechanistic Aspects of Radical Polymerization Reactions with Surface-Attached Monomers

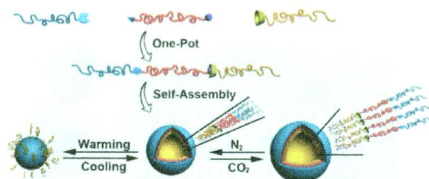
Michael Henze, Daniel Mädge, Oswald Prucker, and Jürgen Rühle\*



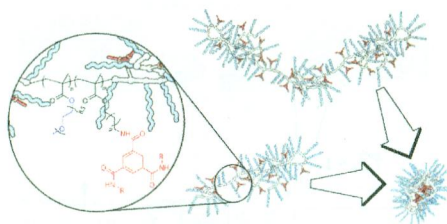


**Synthesis and Self-Assembly of CO<sub>2</sub>-Temperature Dual Stimuli-Responsive Triblock Copolymers**

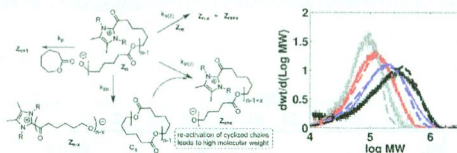
Bo-wen Liu, Hang Zhou, Si-tong Zhou, Hui-juan Zhang, An-Chao Feng, Chun-mei Jian, Jin Hu, Wei-ping Gao, and Jin-ying Yuan\*

**Folding Polymers with Pendant Hydrogen Bonding Motifs in Water: The Effect of Polymer Length and Concentration on the Shape and Size of Single-Chain Polymeric Nanoparticles**

Patrick J. M. Stals, Martijn A. J. Gillissen, Tim F. E. Paffen, Tom F. A. de Greef, Peter Lindner, E. W. Meijer, Anja R. A. Palmans,\* and IJla K. Voets\*

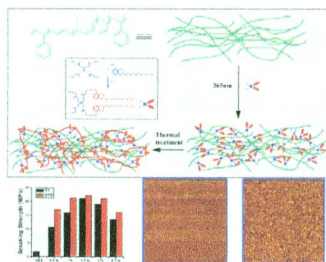
**Zwitterionic Ring-Opening Polymerization: Models for Kinetics of Cyclic Poly(caprolactone) Synthesis**

Hayley A. Brown, Silei Xiong, Grigori A. Medvedev, Young A. Chang, Mahdi M. Abu-Omar, James M. Caruthers, and Robert M. Waymouth\*



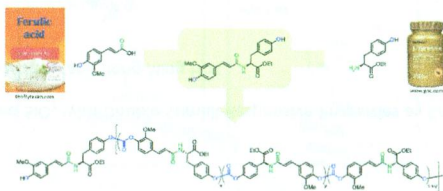
### Tailoring the Morphologies and Mechanical Properties of Styrene–Butadiene–Styrene Triblock Copolymers by the Incorporation of Thiol Functionalized Benzoxazine

Jing Bai, Zixing Shi,\* Jie Yin, and Ming Tian\*



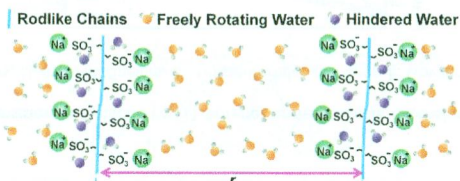
### Poly(carbonate–amide)s Derived from Bio-Based Resources: Poly(ferulic acid-co-tyrosine)

Amandine Noel, Yannick P. Borguet, Jeffery E. Raymond, and Karen L. Wooley\*



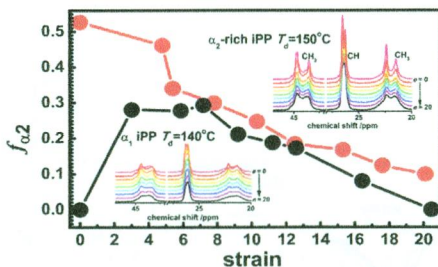
### Molecular Alignment and Ion Transport in Rigid Rod Polyelectrolyte Solutions

Ying Wang, Jianwei Gao, Theo J. Dingemans, and Louis A. Madsen\*



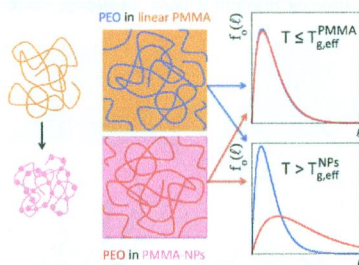
## Two Chain-Packing Transformations and Their Effects on the Molecular Dynamics and Thermal Properties of $\alpha$ -Form Isotactic Poly(propylene) under Hot Drawing: A Solid-State NMR Study

Jia Kang and Toshikazu Miyoshi\*



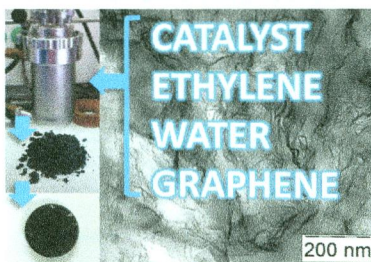
## Investigation of a Nanocomposite of 75 wt % Poly(methyl methacrylate) Nanoparticles with 25 wt % Poly(ethylene oxide) Linear Chains: A Quasielastic Neutron Scattering, Calorimetric, and WAXS Study

D. Bhowmik, J. A. Pomposo, F. Juranyi, V. García Sakai, M. Zamponi, A. Arbe,\* and J. Colmenero



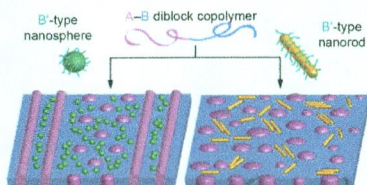
## Composites from Aqueous Polyethylene Nanocrystal/Graphene Dispersions

Alexandra Tchernook, Marina Krumova, Folke Johannes Tölle, Rolf Mülhaupt, and Stefan Mecking\*



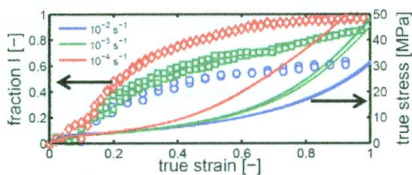
### Co-Assembly of A–B Diblock Copolymers with B'-type Nanoparticles in Thin Films: Effect of Copolymer Composition and Nanoparticle Shape

Amit Halevi, Shira Halivni, Meirav Oded, Axel H. E. Müller, Uri Banin, and Roy Shenhar\*



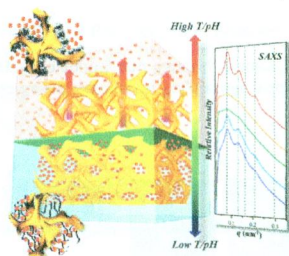
### Kinetics of the Polymorphic Transition in Isotactic Poly(1-butene) under Uniaxial Extension. New Insights From Designed Mechanical Histories

Dario Cavallo,\* Marc J. W. Kanters, Harm J. M. Caelers, Giuseppe Portale, and Leon E. Govaert



### Functionalized Nanoporous Gyroid SiO<sub>2</sub> with Double-Stimuli-Responsive Properties as Environment-Selective Delivery Systems

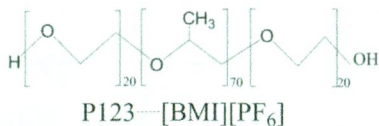
Hui-Chun Lee, Han-Yu Hsueh, U-Ser Jeng, and Rong-Ming Ho\*



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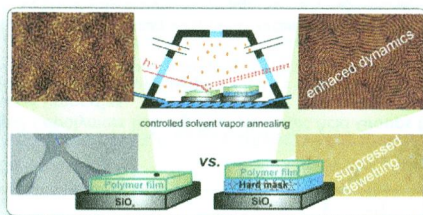
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Using High-Pressure Infrared Spectroscopy to Study the Interactions between Triblock Copolymers and Ionic Liquids  
 Hai-Chou Chang,\* Tsung-Ting Tsai, and Meng-Hsiu Kuo

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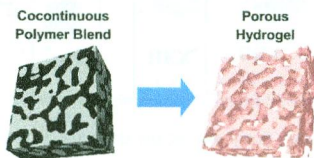
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Enhancing Ordering Dynamics in Solvent-Annealed Block Copolymer Films by Lithographic Hard Mask Supports  
 Anja Stenbock-Fermor, Armin W. Knoll, Alexander Böker,\* and Larisa Tsarkova\*

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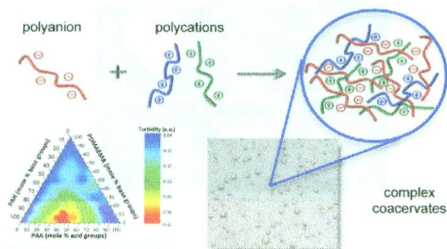
Tunable Porous Hydrogels from Cocontinuous Polymer Blends  
 Anne-Laure Esquirol, Pierre Sarazin, and Nick Virgilio\*

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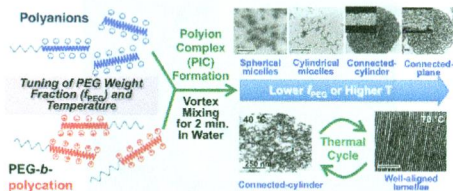
Ternary, Tunable Polyelectrolyte Complex Fluids Driven by Complex Coacervation

Dimitrios Pifritis,\* Xiaoxing Xia, Khatcher O. Margossian, Sarah L. Perry, Lorraine Leon, Jian Qin, Juan J. de Pablo, and Matthew Tirrell



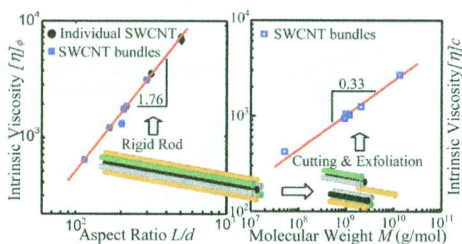
### Morphology Control in Water of Polyion Complex Nanoarchitectures of Double-Hydrophilic Charged Block Copolymers through Composition Tuning and Thermal Treatment

Arie Wibowo, Sukeki Osada, Hiroyuki Matsuda, Yasutaka Anraku, Haruko Hirose, Akihiro Kishimura,\* and Kazunori Kataoka\*



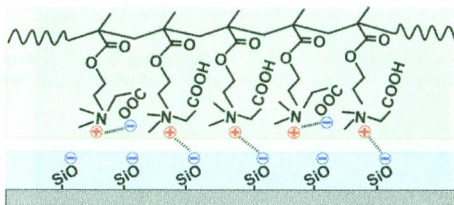
### Determination of the Length, Diameter, Molecular Mass, Density and Surfactant Adsorption of SWCNTs in Dilute Dispersion by Intrinsic Viscosity, Sedimentation, and Diffusion Measurements

Yanbo Yao, Sida Luo, and Tao Liu\*



### Sliding Friction of Zwitterionic Hydrogel and Its Electrostatic Origin

Jamil Ahmed, Honglei Guo, Tetsuro Yamamoto, Takayuki Kurokawa, Masakazu Takahata, Tasuku Nakajima, and Jian Ping Gong\*



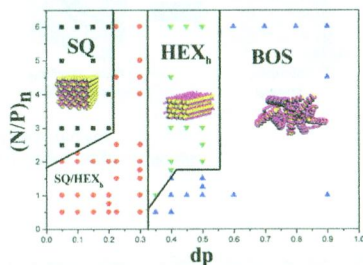
## The Polyelectrolyte Complex/Coacervate Continuum

Qifeng Wang and Joseph B. Schlenoff\*



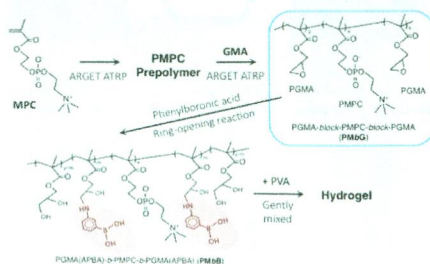
## Structure of the Electrostatic Complex of DNA with Cationic Dendrimer of Intermediate Generation: The Role of Counterion Entropy

Cheng-Che Yang, Yen-Chih Huang, Chun-Yu Chen, Chun-Jen Su, Hsin-Lung Chen,\* and Viktor A. Ivanov



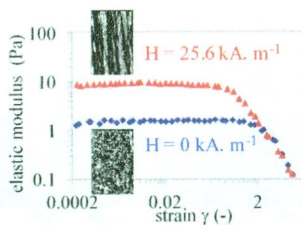
## Amphiphilic Triblock Phospholipid Copolymers Bearing Phenylboronic Acid Groups for Spontaneous Formation of Hydrogels with Tunable Mechanical Properties

Surasak Chantasirichot, Yuuki Inoue, and Kazuhiko Ishihara\*



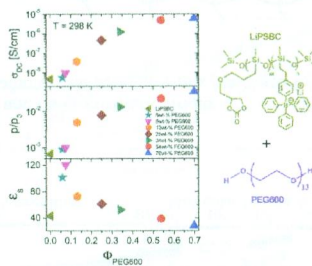
### Elaboration and Rheological Investigation of Magnetic Sensitive Nanocomposite Biopolymer Networks

Cécilia Galindo-Gonzalez, Stéphanie Gantz, Laurence Ourry, Fayna Mammeri, Souad Ammar-Merah, and Alain Ponton\*



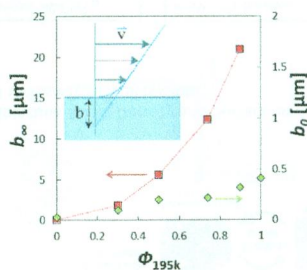
### Influence of Solvating Plasticizer on Ion Conduction of Polysiloxane Single-Ion Conductors

U Hyeok Choi, Siwei Liang, Michael V. O'Reilly, Karen I. Winey, James Runt, and Ralph H. Colby\*



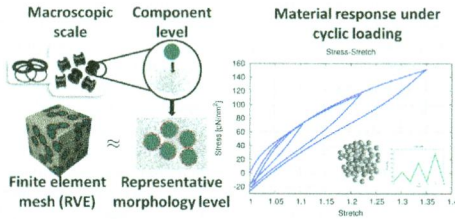
### Wall Slip of Bidisperse Linear Polymer Melts

S. Mostafa Sabzevari, Itai Cohen, and Paula M. Wood-Adams\*





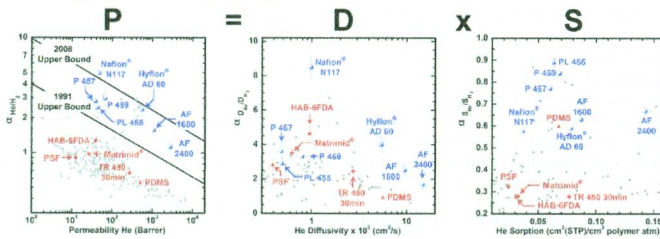
Finite Element-Based Micromechanical Modeling of Microstructure Morphology in Filler-Reinforced Elastomer  
 Deepanshu Sodhani\* and Stefanie Reese



Influence of Diffusivity and Sorption on Helium and Hydrogen Separations in Hydrocarbon, Silicon, and Fluorocarbon-Based Polymers

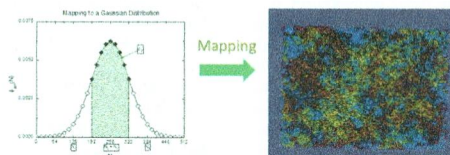
Zachary P. Smith, Rajkiran R. Tiwari, Michelle E. Dose, Kristofer L. Gleason, Thomas M. Murphy, David F. Sanders, Gabriella Gunawan, Lloyd M. Robeson, Donald R. Paul, and Benny D. Freeman\*

Highly or Completely Fluorinated / Not Perfluorinated

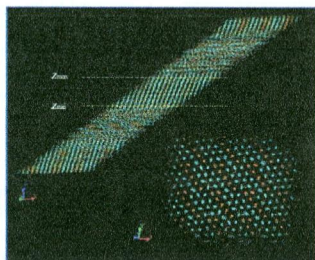


Finding the Missing Physics: Mapping Polydispersity into Lattice-Based Simulations

Nicholas A. Rorrer and John R. Dorgan\*

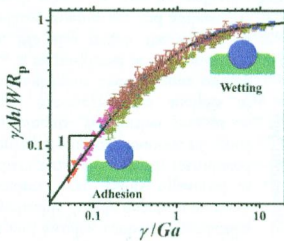


Molecular Dynamics of Crystallization in a Helical Polymer Isotactic Polypropylene from the Oriented Amorphous State  
Takashi Yamamoto\*



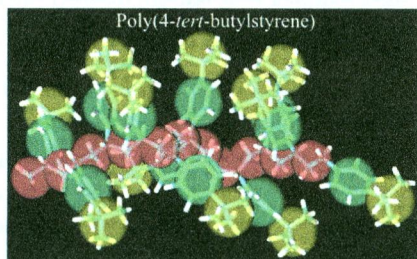
Adhesion and Wetting of Nanoparticles on Soft Surfaces

Zhen Cao, Mark J. Stevens, and Andrey V. Dobrynin\*



Coarse-Graining Atactic Polystyrene and Its Analogues

Anupriya Agrawal, Dipak Aryal, Dvora Perahia,\* Ting Ge, and Gary S. Grest



# Tuning Structure and Rheology of Silica–Latex Nanocomposites with the Molecular Weight of Matrix Chains: A Coupled SAXS–TEM–Simulation Approach

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