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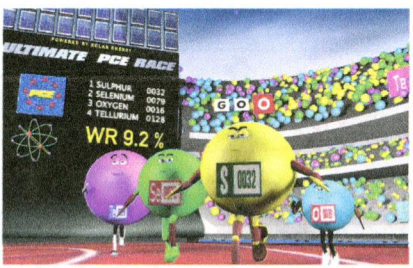
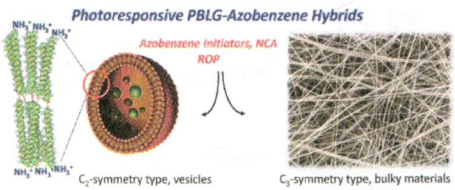
ON THE COVER: In recent years, there has been a large amount of interest in the development of conjugated polymers as alternatives to inorganic semiconductors for use in a range of electronic applications. One of the many positive attributes of these materials is the ability to manipulate their properties through chemical synthesis. In this Perspective, we focus specifically on the use of the group 16 elements oxygen, sulfur, selenium, and tellurium to tune the properties of conjugated polymers. Given the current interest in renewable energy, we are highlighting the impact these modifications have on the performance of these conjugated polymers in photovoltaic cells. See page 7253.

Perspective



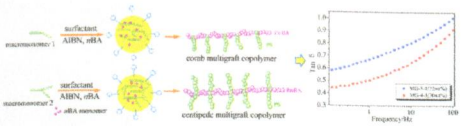
Articles



7284 S DOI: 10.1021/ma501866t

Synthesis and Characterization of Comb and Centipede Multigraft Copolymers P*n*BA-*g*-PS with High Molecular Weight Using Miniemulsion Polymerization

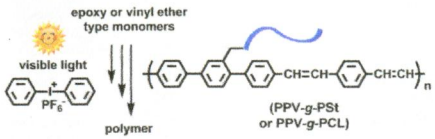
Wenwen Wang, Weiyu Wang, Xinyi Lu, Sachin Bobade, Jihua Chen, Nam-Goo Kang, Qiuyu Zhang,* and Jimmy Mays*



7296 S DOI: 10.1021/ma5019457

Poly(phenylenevinylene)s as Sensitizers for Visible Light Induced Cationic Polymerization

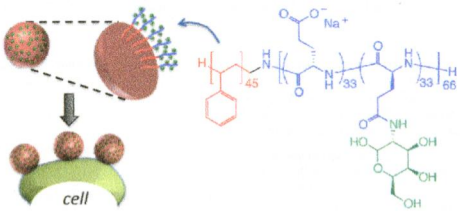
Semih Erdur, Gorkem Yilmaz, Demet Goen Colak, Ioan Cianga, and Yusuf Yagci*



7303 S DOI: 10.1021/ma5020462

Facile Synthesis of Fluorescent Latex Nanoparticles with Selective Binding Properties Using Amphiphilic Glycosylated Polypeptide Surfactants

J. Jacobs, A. Byrne, N. Gathergood, T. E. Keyes, J. P. A. Heuts, and A. Heise*



7311 S DOI: 10.1021/ma501541g

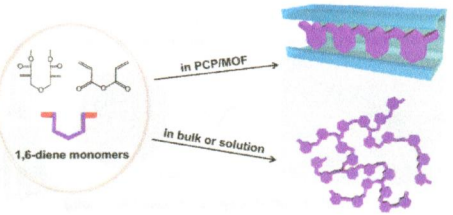
ATRP of POSS Monomers Revisited: Toward High-Molecular Weight Methacrylate–POSS (Co)Polymers

Vladimír Raus,* Eva Čadová, Larisa Starovoytova, and Miroslav Janata

7321 S DOI: 10.1021/ma501232n

Controlled Cyclopolymerization of Difunctional Vinyl Monomers in Coordination Nanochannels

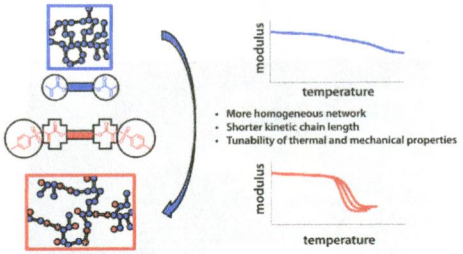
Takashi Uemura,* Ryo Nakanishi, Tetsuya Kaseda, Noriyuki Uchida, and Susumu Kitagawa*



7327 S DOI: 10.1021/ma501550b

β-Allyl Sulfones as Addition–Fragmentation Chain Transfer Reagents: A Tool for Adjusting Thermal and Mechanical Properties of Dimethacrylate Networks

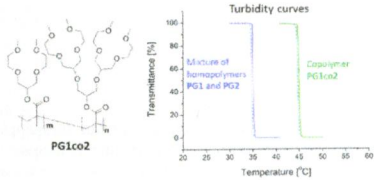
Christian Gorsche, Markus Griesser, Georg Gescheidt, Norbert Moszner, and Robert Liska*



7337 S DOI: 10.1021/ma5017192

Synthesis of Neutral, Water-Soluble Oligo–Ethylene Glycol-Containing Dendronized Homo- and Copolymers of Generations 1, 1.5, 2, and 3

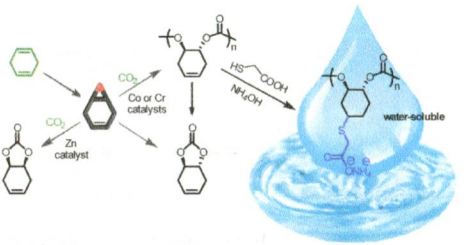
Xiaoyu Sun, Jean-Pierre Lindner, Bernd Bruchmann, and A. Dieter Schlüter*



7347 DOI: 10.1021/ma501781k

Copolymerization and Cycloaddition Products Derived from Coupling Reactions of 1,2-Epoxy-4-cyclohexene and Carbon Dioxide. Postpolymerization Functionalization via Thiol−Ene Click Reactions

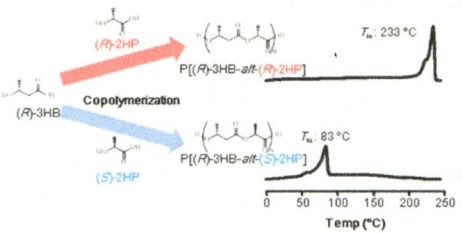
Donald J. Darensbourg,* Wan-Chun Chung, Christopher J. Arp, Fu-Te Tsai, and Samuel J. Kyran



7354 S DOI: 10.1021/ma501783f

Synthesis and Properties of Alternating Copolymers of 3-Hydroxybutyrate and Lactate Units with Different Stereocompositions

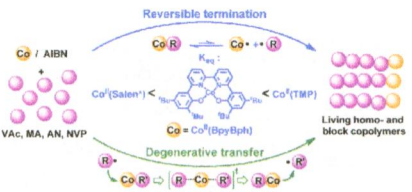
Yuta Tabata and Hideki Abe*



7362 S DOI: 10.1021/ma5018764

Cobalt Bipyridine Bisphenolate Complex in Controlled/Living Radical Polymerization of Vinyl Monomers

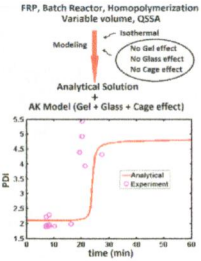
Yi-Chien Lin, Yi-Liang Hsieh, Yuan-Deng Lin, and Chi-How Peng*



7370 DOI: 10.1021/ma501413m

Analytical Solution of Free Radical Polymerization: Applications- Implementing Gel Effect Using AK Model

Dhiraj K. Garg, Christophe A. Serra,* Yannick Hoarau, Dambarudhar Parida, M. Bouquey, and R. Muller



7378 DOI: 10.1021/ma5014397

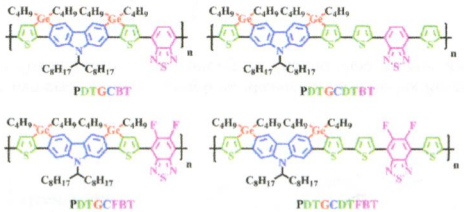
Direct Arylation Polycondensation of Bithiazole Derivatives with Various Acceptors

Masahiro Kuramochi, Junpei Kuwabara,* Wei Lu, and Takaki Kanbara*

7386 DOI: 10.1021/ma5018499

A New Ladder-Type Germanium-Bridged Dithienocarbazole Arene and Its Donor–Acceptor Conjugated Copolymers: Synthesis, Molecular Properties, and Photovoltaic Applications

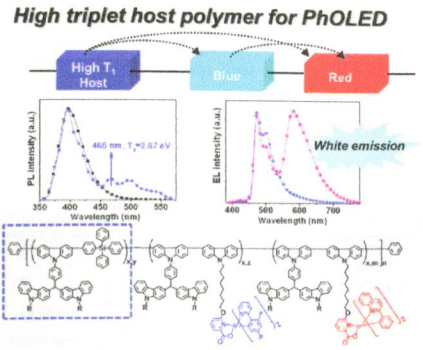
Pei-Chi Jwo, Yu-Ying Lai, Che-En Tsai, Yun-Yu Lai, Wei-Wei Liang, Chain-Shu Hsu, and Yen-Ju Cheng*



7397 (S) DOI: 10.1021/ma5015929

Synthesis of High-Triplet-Energy Host Polymer for Blue and White Electrophosphorescent Light-Emitting Diodes

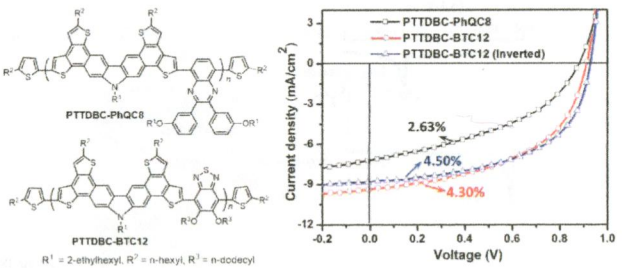
Fei Xu, Ji-Hoon Kim, Hee Un Kim, Jae-Ho Jang, Kyoung Soo Yook, Jun Yeob Lee,* and Do-Hoon Hwang*



7407 (S) DOI: 10.1021/ma501736m

Tetrathienodibenzocarbazole Based Donor–Acceptor Type Wide Band-Gap Copolymers for Polymer Solar Cell Applications

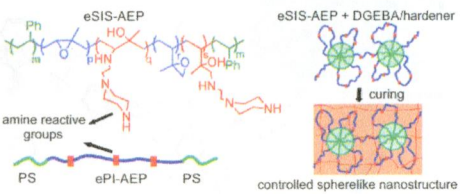
Zhong'an Li, Yue Zang, Chu-Chen Chueh, Namchul Cho, Jinrong Lu, Xuyang Wang, Jiang Huang, Chang-Zhi Li, Junsheng Yu, and Alex K.-Y. Jen*



7416 (S) DOI: 10.1021/ma501496x

Controlling Nanodomain Morphology of Epoxy Thermosets Modified with Reactive Amine-Containing Epoxidized Poly(styrene-*b*-isoprene-*b*-styrene) Block Copolymer

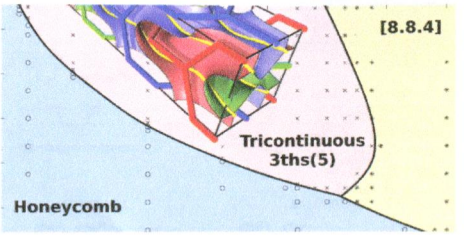
Hernan Garate, Silvia Goyanes,* and Norma B. D'Accorso*



7424 S DOI: 10.1021/ma5016352

The Tricontinuous *3ths*(5) Phase: A New Morphology in Copolymer Melts

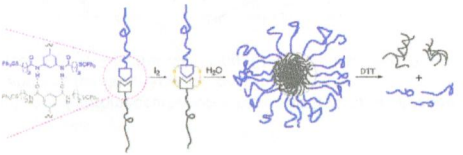
Michael G. Fischer, Liliana de Campo, Jacob J. K. Kirkensgaard, Stephen T. Hyde, and Gerd E. Schröder-Turk*



7431 S DOI: 10.1021/ma5017083

Dynamic Covalent Diblock Copolymers: Instructed Coupling, Micellation and Redox Responsiveness

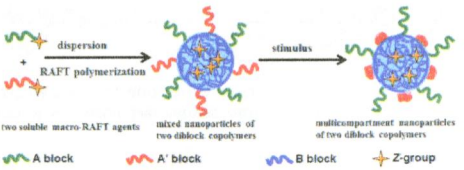
Qinglai Yang, Ling Bai, Yuanqing Zhang, Fangxia Zhu, Yuhong Xu, Zhifeng Shao, Yu-Mei Shen,* and Bing Gong*



7442 S DOI: 10.1021/ma501598k

A New Strategy To Synthesize Temperature- and pH-Sensitive Multicompartment Block Copolymer Nanoparticles by Two Macro-RAFT Agents Comediated Dispersion Polymerization

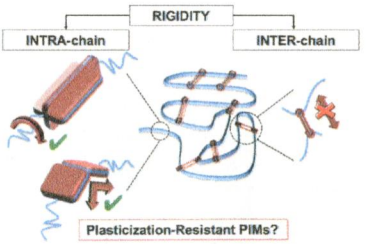
Pengfei Shi, Quanlong Li, Xin He, Shentong Li, Pingchuan Sun, and Wangqing Zhang*



7453 S DOI: 10.1021/ma501798v

Role of Intrachain Rigidity in the Plasticization of Intrinsically Microporous Triptycene-Based Polyimide Membranes in Mixed-Gas CO_2/CH_4 Separations

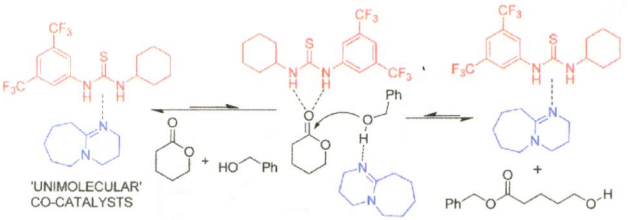
Raja Swaidan, Bader Ghanem, Majed Al-Saeedi, Eric Litwiller, and Ingo Pinnau*



7463 S DOI: 10.1021/ma501847x

Cooperative Hydrogen-Bond Pairing in Organocatalytic Ring-Opening Polymerization

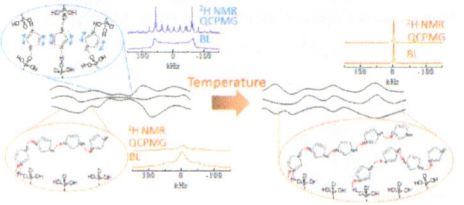
Oleg I. Kazakov, Partha P. Datta, Meghedi Isajani, Elizabeth T. Kiesewetter, and Matthew K. Kiesewetter*



7469 S DOI: 10.1021/ma5013418

Local Structure and Dynamics of Imidazole Molecules in Proton-Conducting Poly(vinylphosphonic acid)–Imidazole Composite Material

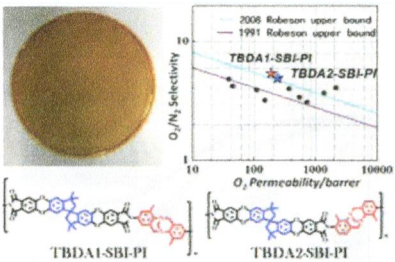
Motohiro Mizuno,* Ayano Iwasaki, Tsuyoshi Umiyama, Ryutaro Ohashi, and Tomonori Ida



7477 Ⓢ DOI: 10.1021/ma5017506

Microporous Polyimides with Rationally Designed Chain Structure Achieving High Performance for Gas Separation

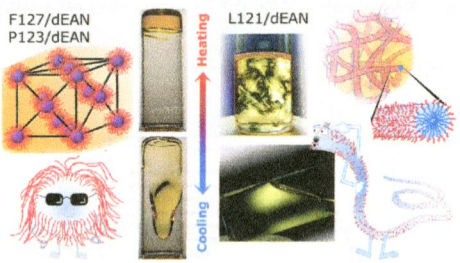
Zhenggong Wang, Dong Wang,* and Jian Jin*



7484 Ⓢ DOI: 10.1021/ma501238w

Triblock Copolymer Self-Assembly in Ionic Liquids: Effect of PEO Block Length on the Self-Assembly of PEO–PPO–PEO in Ethylammonium Nitrate

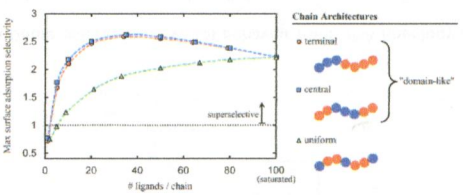
Carlos R. López-Barrón,* Dongcui Li, Norman J. Wagner, and Jeffrey L. Caplan



7496 DOI: 10.1021/ma5014918

Optimizing the Selectivity of Surface-Adsorbing Multivalent Polymers

Nicholas B. Tito and Daan Frenkel*

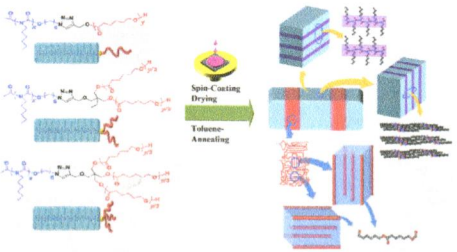


7510 $

DOI: 10.1021/ma501695b

Hierarchical Structures in Thin Films of Miktoarm Star Polymers: Poly(*n*-hexyl isocyanate)(12K)–Poly(ε-caprolactone)$_{1-3}$(5K)

Young Yong Kim, Sungmin Jung, Changsub Kim, Brian J. Ree, Daisuke Kawato, Naoki Nishikawa, Daichi Suemasa, Takuya Isono, Toyoji Kakuchi,* Toshifumi Satoh,* and Moonhor Ree*

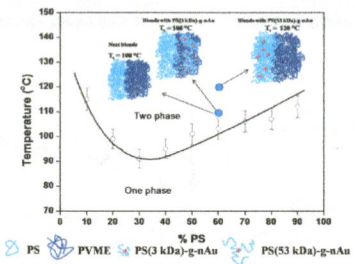


7525

DOI: 10.1021/ma501844s

Thermally Induced Demixing in an LCST Mixture in the Presence of Densely Grafted Nanoparticles: Tuning the Graft Chain Length To Induce Thermodynamic Miscibility

Goutam Prasanna Kar, Nafisa Begam, J. K. Basu, and Suryasarathi Bose*

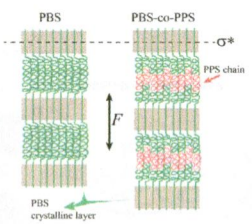


7533

DOI: 10.1021/ma501832z

Critical Stress for Crystal Transition in Poly(butylene succinate)-Based Crystalline–Amorphous Multiblock Copolymers

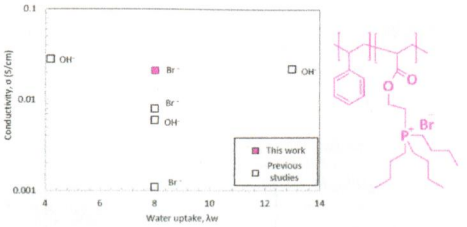
Guoming Liu, Liuchun Zheng, Xiuqin Zhang, Chuncheng Li, and Dujin Wang*



7540 DOI: 10.1021/ma501744w

High Anion Conductivity and Low Water Uptake of Phosphonium Containing Diblock Copolymer Membranes

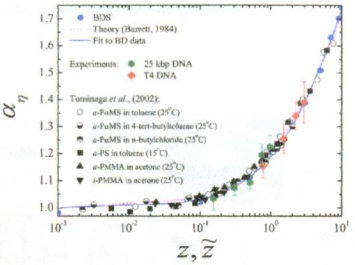
Pepa Cotanda, Guillaume Sudre, Miguel A. Modestino, X. Chelsea Chen, and Nitash P. Balsara*



7548 DOI: 10.1021/ma500960f

Viscosity Radius of Polymers in Dilute Solutions: Universal Behavior from DNA Rheology and Brownian Dynamics Simulations

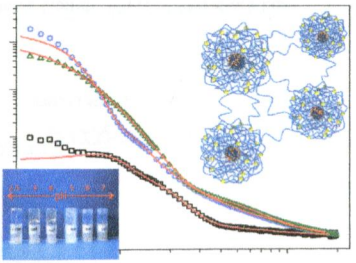
Sharadwata Pan, Deepak Ahirwal, Duc At Nguyen, T. Sridhar, P. Sunthar, and J. Ravi Prakash*



7561 DOI: 10.1021/ma501671s

Physical Hydrogels via Charge Driven Self-Organization of a Triblock Polyampholyte – Rheological and Structural Investigations

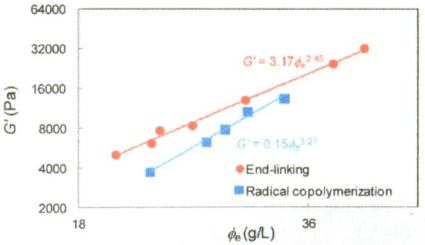
M. A. Dyakonova, N. Stavrouli, M. T. Popescu, K. Kyriakos, I. Grillo, M. Philipp, S. Jaksch, C. Tsitsilianis,* and C. M. Papadakis*



7573 S DOI: 10.1021/ma501786h

Model Polyelectrolyte Gels Synthesized by End-Linking of Tetra-Arm Polymers with Click Chemistry: Synthesis and Mechanical Properties

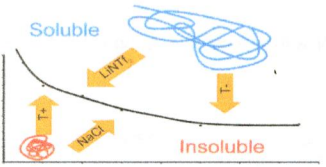
Kazuyuki Oshima,* Taku Fujimoto, Erina Minami, and Yoshiro Mitsukami



7581 S DOI: 10.1021/ma501924r

Counterion-Induced UCST for Polycations

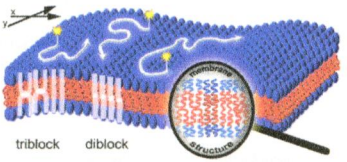
Erno Karjalainen, Vladimir Aseyev, and Heikki Tenhu*



7588 S DOI: 10.1021/ma5015403

Molecular Organization and Dynamics in Polymersome Membranes: A Lateral Diffusion Study

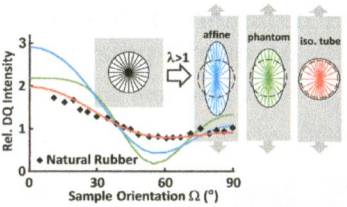
Fabian Itel, Mohamed Chami, Adrian Najer, Samuel Lörcher, Dalin Wu, Ionel A. Dinu, and Wolfgang Meier*



7597 S DOI: 10.1021/ma5012655

Microscopic Study of Chain Deformation and Orientation in Uniaxially Strained Polymer Networks: NMR Results versus Different Network Models

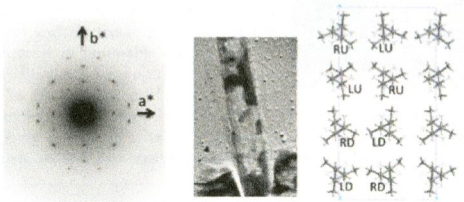
Maria Ott,* Roberto Pérez-Aparicio, Horst Schneider, Paul Sotta, and Kay Saalwächter*



7612 S DOI: 10.1021/ma5009868

A New ε Crystal Modification Found in Stereodefective Isotactic Polypropylene Samples

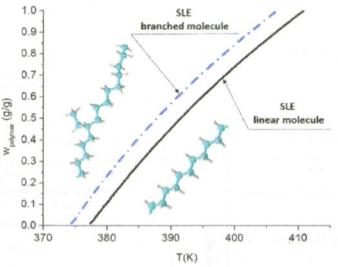
Bernard Lotz*



7625 DOI: 10.1021/ma501440x

A Theory for Solubility of Semicrystalline and Branched Polymers in One Solvent

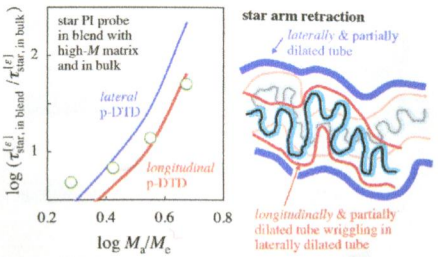
Michael Fischlschweiger and Sabine Enders*



7637 S DOI: 10.1021/ma501561y

Dielectric and Viscoelastic Behavior of Star-Branched Polyisoprene: Two Coarse-Grained Length Scales in Dynamic Tube Dilation

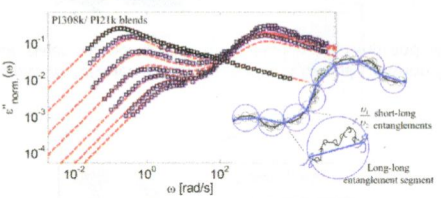
Yumi Matsumiya, Yuichi Masubuchi, Tadashi Inoue, Osamu Urakawa, Chen-Yang Liu, Evelyne van Ruymbeke, and Hiroshi Watanabe*



7653 DOI: 10.1021/ma501566w

Dynamic Dilution Effect in Binary Blends of Linear Polymers with Well-Separated Molecular Weights

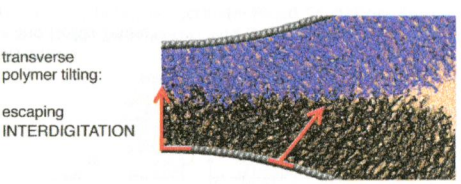
E. van Ruymbeke,* V. Shchetnikava, Y. Matsumiya, and H. Watanabe



7666 DOI: 10.1021/ma501718b

Friction in (Im-) Miscible Polymer Brush Systems and the Role of Transverse Polymer Tilting

Sissi de Beer and Martin H. Müser*

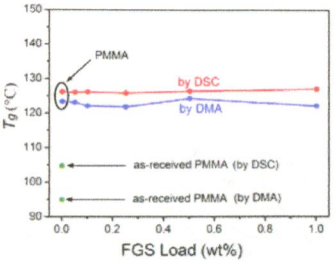


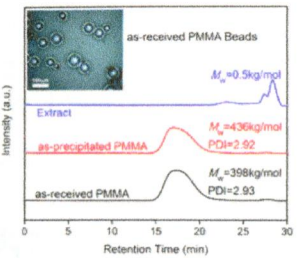
Notes

7674 (S) DOI: 10.1021/ma501709g

Influence of Functionalized Graphene Sheets on Modulus and Glass Transition of PMMA

Ken-Hsuan Liao, Shingo Kobayashi, Hyunwoo Kim, Ahmed A. Abdala,* and Christopher W. Macosko*





Additions and Corrections

7677 DOI: 10.1021/ma5020963

Correction to Local Flips and Chain Motion in Polyethylene Crystallites: A Comparison of Melt-Crystallized Samples, Reactor Powders, and Nanocrystals

Ruth Bärenwald, Sylvia Goerlitz, Reinhold Godehardt, Anna Osichow, Qiong Tong, Marina Krumova, Stefan Mecking, and Kay Saalwächter*

(S) Supporting Information available via online article