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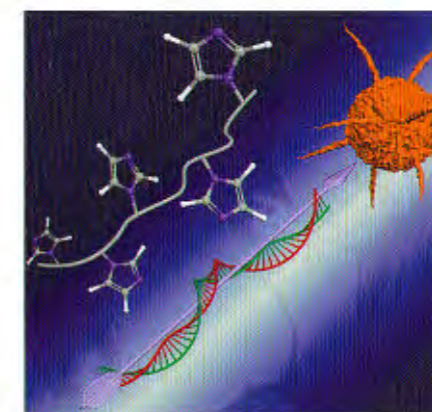
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Poly(1-vinylimidazole) Prospects in Gene Delivery

Elena N. Danilovtseva, Stanislav N. Zelinskiy, Viktor A. Pal'shin, Gayathri Kandasamy, Uma Maheswari Krishnan, and Vadim V. Annenkov

Poly(1-vinylimidazole) was found as a promising polymer for binding short nucleic acid chains. The obtained polyplexes are able to internalize into living cells. Influence of the polymer quaternization and pH on polyplex stability as well as fluorescence tagging and the prospects of poly(1-vinylimidazole) in gene therapy of cancer are discussed.



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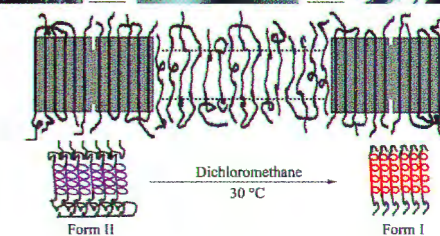
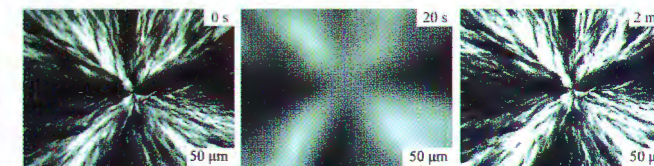
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Rapid Communications

Ultrafast Form II to I Transition of Isotactic Polybutene-1

Xing Qiu, Umair Azhar, Jing-Qing Li, Ding-Hai Huang, and Shi-Chun Jiang

An ultrafast II-I transition of *i*PB-1 has been achieved after treating with dichloromethane at 30 °C, though the framework of *i*PB-1 spherulite could not be modified. The proposed ultrafast II-I transition of *i*PB-1 is attributed to the solvent-induced packed-mesophase from form II and the temperature-related chain conformation adjustment for form I.

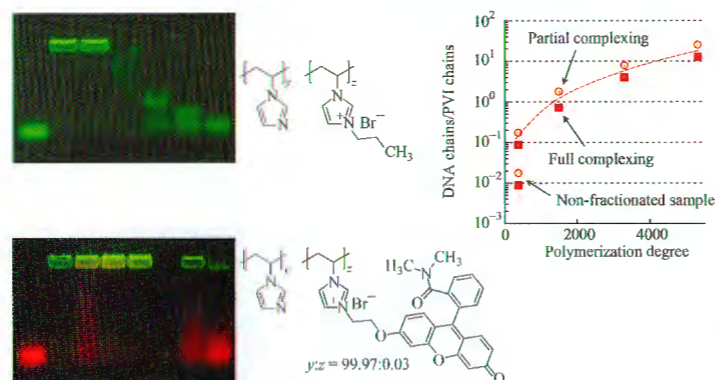


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Poly(1-vinylimidazole) Prospects in Gene Delivery

Elena N. Danilovtseva, Stanislav N. Zelinskiy, Viktor A. Pal'shin, Gayathri Kandasamy, Uma Maheswari Krishnan, and Vadim V. Annenkov

Complexation of poly(1-vinylimidazole) and oligomeric DNA was studied. Increase in the polymer charge by quaternization or decrease in pI values to 6.5–7 considerably increased the interaction. The minimal critical length for quaternized poly(1-vinylimidazole) was below 8. Fluorescent-tagged samples were obtained for monitoring the polymer-oligonucleotide complex internalization into living cells.

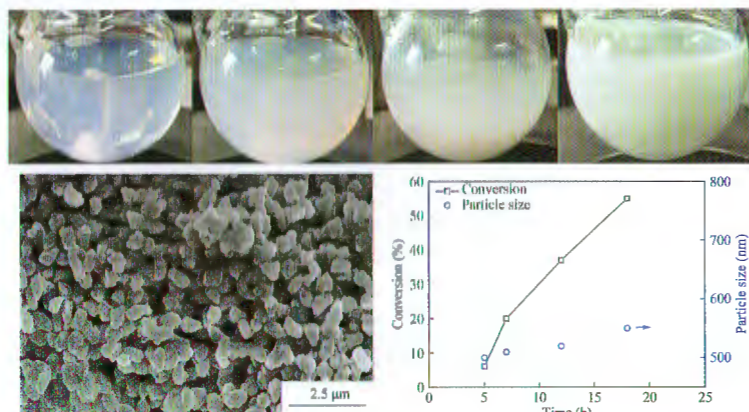


Chinese Journal of Polymer Science, 2019, 37(7), 637–645
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Preparation of Ultralow Molecular Weight Poly(vinyl chloride) with Submicrometer Particles *via* Precipitation Polymerization

Peng Cui, Chang-Tong Song, Xian-Hong Zhang, Dong Chen, Yu-Hong Ma, and Wan-Tai Yang

Ultralow molecular weight poly(vinyl chloride) resin ($M_n \sim 4000$ to 10000) with sub-micrometer particles has been successfully prepared by a new precipitation polymerization process in the absence of any external dispersion or surfactant agents. The nonpolar solvent is helpful to forming spherical particles with smooth surface.

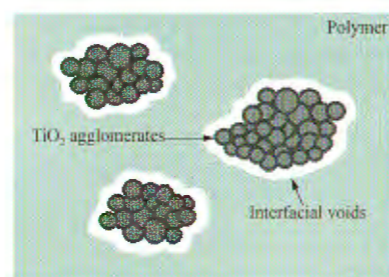


Chinese Journal of Polymer Science, 2019, 37(7), 646–653
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Dispersion of Titanium(IV) Oxide Nanoparticles in Mixed Matrix Membrane Using Octaisobutyl Polyhedral Oligomeric Silsesquioxane for Enhanced CO₂/CH₄ Separation Performance

Grace Ying En Tan, Pei Ching Oh, Kok Keong Lau, and Siew Chun Low

TiO₂ nanoparticles have a high agglomeration tendency due to high surface energy and attractive van der Waals forces. The formation of TiO₂ agglomerates could result in interfacial voids which deteriorates the gas separation performance of MMMs. POSS was added to disperse the TiO₂ nanoparticles evenly in the polymer matrix.

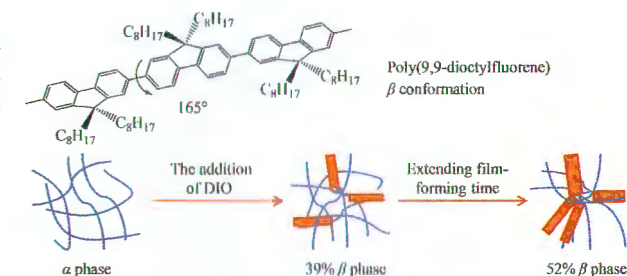


Chinese Journal of Polymer Science, 2019, 37(7), 654–663
<https://doi.org/10.1007/s10118-019-2246-8>

Increasing the Content of β Phase of Poly(9,9-dioctylfluorene) by Synergistically Controlling Solution Aggregation and Extending Film-forming Time

Ya-Di Liu, Qiang Zhang, Xin-Hong Yu, Jian-Gang Liu, and Yan-Chun Han

The β phase in poly(9,9-dioctylfluorene) (PFO) shows a coplanar structure, which favors charge carrier transport. In our work, the content of β phase has been enhanced to 52% by the addition of 1,8-diodooctane (DIO) and keeping films in a sealed environment with *o*-xylene atmosphere, reaching the highest value reported so far.

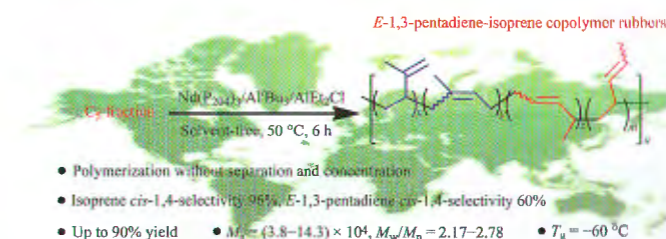


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<https://doi.org/10.1007/s10118-019-2259-3>

Neodymium-catalyzed Polymerization of C₅ Fraction: Efficient Synthesis of 1,3-Pentadiene-isoprene Copolymer Rubbers

Jin Yan Hou, Fang Guo, Qian Hu, Yang Li, and Zhao-Min Hou

The polymerization of C₅ fraction without separation and concentration by using a commercial available Nd(P₂O₇)₃/AlⁱBu₃/AlEt₂Cl afforded a new kind of *E*-1,3-pentadiene-isoprene random copolymers as rubber materials with high *cis*-1,4-selectivity, low glass transition temperature, and controllable molecular weight.

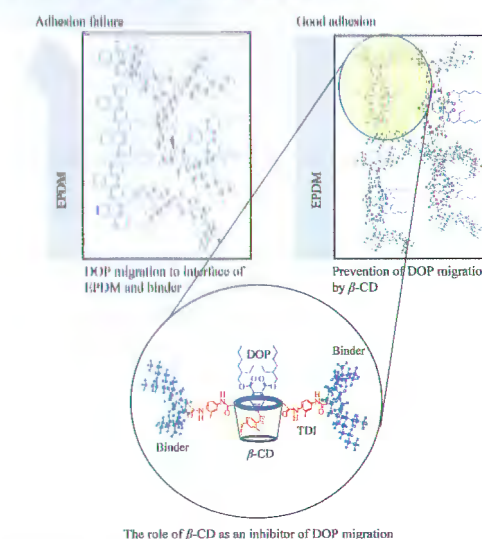


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<https://doi.org/10.1007/s10118-019-2244-x>

Using an Inhibitor to Prevent Plasticizer Migration from Polyurethane Matrix to EPDM Based Substrate

Hadi Rezaei-Vahidian, Tohid Farajpour, and Mahdi Abdollahi

A new derivative of β -cyclodextrin has been synthesized and characterized with applied point of view, to prevent DOP plasticizer migration from polyurethane matrix to EPDM based substrate.

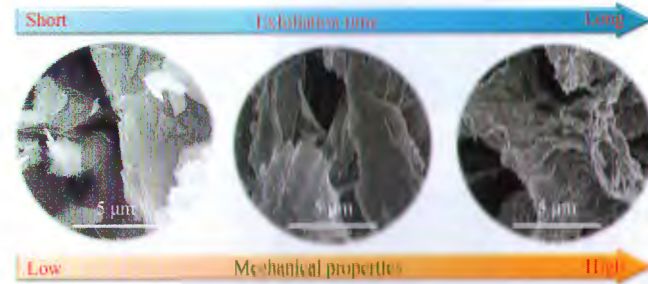


Chinese Journal of Polymer Science, 2019, 37(7), 681–686
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Effect of Molybdenum Disulfide Exfoliation Conditions on the Mechanical Properties of Epoxy Nanocomposites

Bin Chen, Bao-Jia Ni, Meng-Xiang Fu, Hang Zhong, Wei-Feng Jiang, Si-Yuan Liu, He-Xin Zhang, and Keun-Byoung Yoon

In this research, the MoS₂ fillers with different functional group concentrations were prepared through adjusting intercalation time. Because of the higher functional group concentration, the interfacial adhesion force between EP and MoS₂ was enhanced. Thus, prolonging the intercalation time of MoS₂ could improve the mechanical properties of EP/MoS₂ nanocomposites.

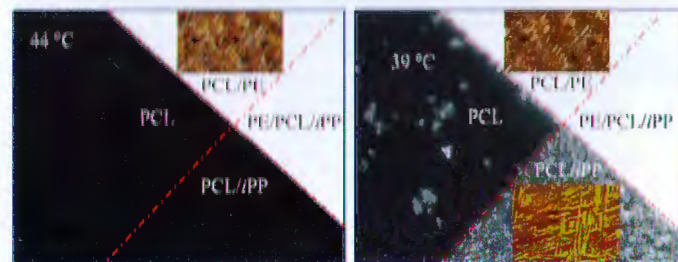


Chinese Journal of Polymer Science, 2019, 37(7), 687–692
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Direct Comparison of Crystal Nucleation Activity of PCL on Patterned Substrates

Jian Hu, Rui Xin, Chun-Yue Hou, Shou-Ke Yan, and Ji-Chun Liu

Crystallization of PCL during cooling its melt at a rate of 1 °C min⁻¹ in bulk as well as at PE and iPP surfaces was studied. While the crystallization of PCL in contact with PE produced parallel-aligned lamellae, cross-hatched PCL lamellae were observed on iPP surface. The crystallization of PCL completed at 44 and 39 °C at PE and iPP surfaces, respectively.

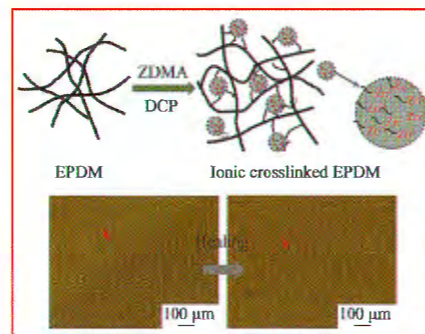


Chinese Journal of Polymer Science, 2019, 37(7), 693–699
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Self-healing Behavior of Ethylene Propylene Diene Rubbers Based on Ionic Association

Zhi-Fei Zhang, Kun Yang, Shu-Gao Zhao, and Lai-Na Guo

In this study, a self-healing EPDM elastomer, combining covalent and ionic cross-links, was prepared by graft-polymerizing zinc dimethacrylate (ZDMA) onto rubber chains induced by DCP and controlling vulcanization process. The network structure could be tuned by controlling vulcanization process to achieve tailorable mechanical and self-healing properties.

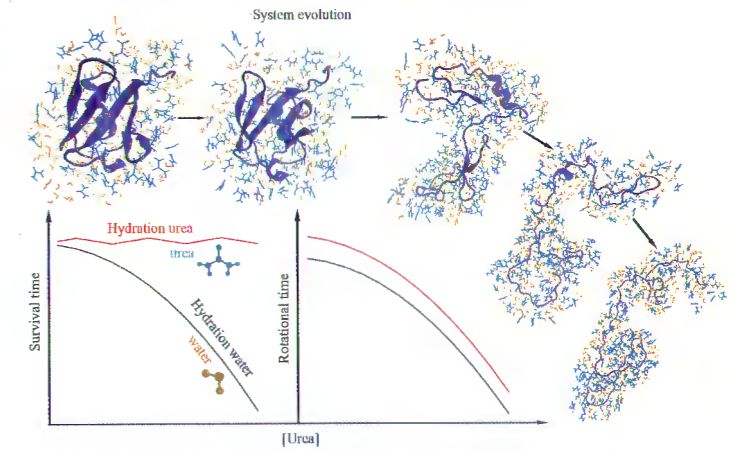


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Evolution of Conformation and Dynamics of Solvents in Hydration Shell along the Urea-induced Unfolding of Ubiquitin

Ke-Cheng Yang, Feng-Chao Cui, Ce Shi, Wen-Duo Chen, and Yun-Qi Li

Ubiquitin goes through a sequential unfolding process with a commensurate level of hydrogen-bond disruption and surface exposure in urea aqueous solution. The dynamics of urea molecules in the hydration shell is much slower and less affected by the unfolding extent of ubiquitin than that of water molecules.

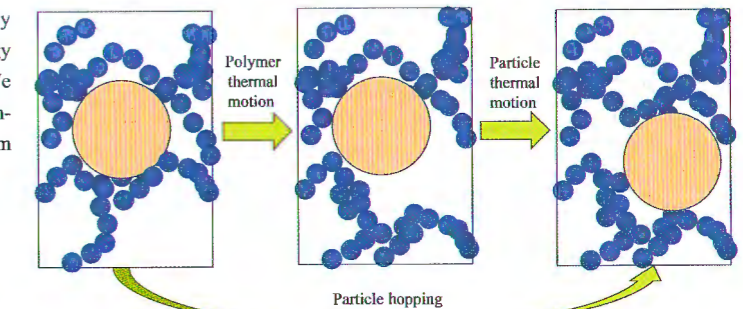


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Diffusion Mode Transition between Gaussian and Non-Gaussian of Nanoparticles in Polymer Solutions

Yi Ye, Han Qin, Ming Tian, and Jian-Guo Mi

We analyze nanoparticle diffusion in polymer solutions via the strictly time-dependent, microscopic, and collective density and energy fluctuation under the framework of dynamic density functional theory. We show clearly the transition process of diffusion from Gaussian to non-Gaussian type and the details of non-Gaussian behavior arising from hopping diffusion.



Chinese Journal of Polymer Science, 2019, 37(7), 719–728
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