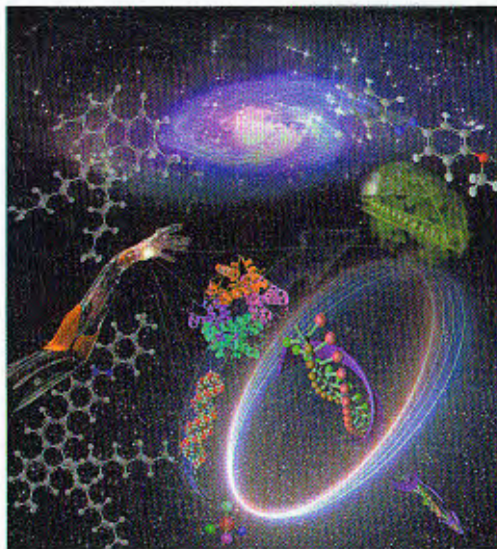


Cover Image

Construction of Supramolecular Chirality in Polymer Systems: Chiral Induction, Transfer and Application

Xiao-Xiao Cheng, Teng-Fei Miao, Lu Yin, Wei Zhang, and Xiu-Lin Zhu

The feature article mainly summarizes the progress of the construction of supramolecular chirality in polymer systems based on the chirality induction, transfer as well as the applications in different fields.



Chinese Journal of Polymer Science, 2021, 39(11), 1357–1375

<https://doi.org/10.1007/s10118-021-2561-8>

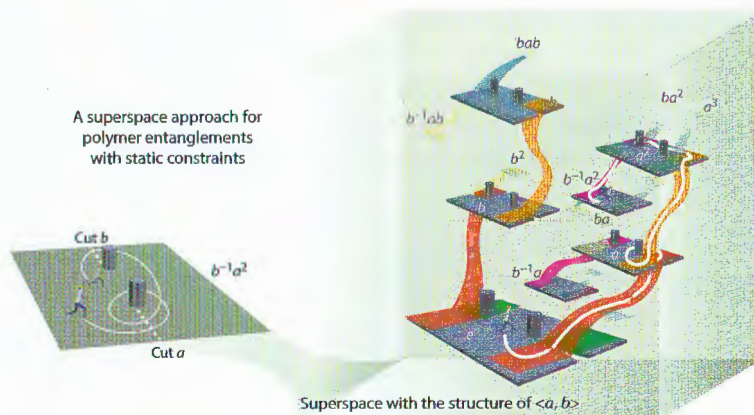
Contents

Rapid Communications

Force-Extension Curve of an Entangled Polymer Chain: A Superspace Approach

Huan Gong, Jian-Feng Li, Hong-Dong Zhang,
and An-Chang Shi

Polymer entanglements with static topological constraints can be properly described by the probability diffusion in a superspace with an inner structure characterized by the n -generator free group.



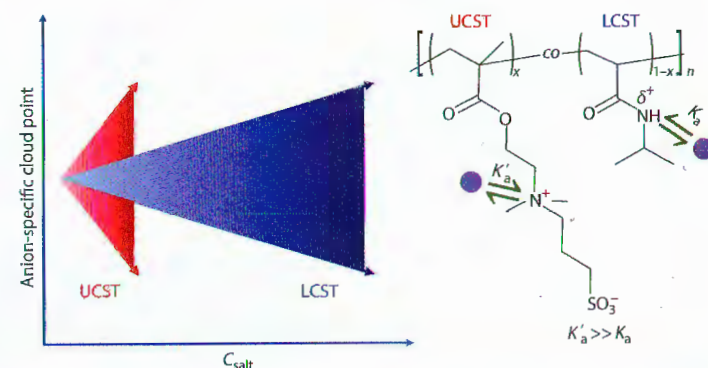
Chinese Journal of Polymer Science, 2021, 39(11), 1345–1350

<https://doi.org/10.1007/s10118-021-2623-y>

The Anion Binding Affinity Determines the Strength of Anion Specificities of Thermosensitive Polymers

Lei-Lei Lian, Si-Yuan Xu, Hai-Yang Yuan, and Guang-Ming Liu

The effect of a similar strength of specific anion on thermoresponsive behaviors can be observed at very different salt concentrations for the different types of thermosensitive polymers, because the anions can specifically interact with the different types of thermosensitive polymers in very different strengths.



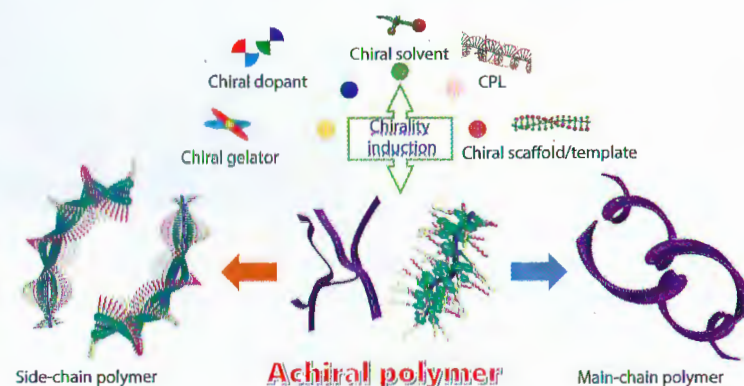
Chinese Journal of Polymer Science, 2021, 39(11), 1351–1356
<https://doi.org/10.1007/s10118-021-2633-9>

Feature Articles

Construction of Supramolecular Chirality in Polymer Systems: Chiral Induction, Transfer and Application

Xiao-Xiao Cheng, Teng-Fei Miao, Lu Yin, Wei Zhang, and Xiu-Lin Zhu

Chirality induction is highly efficient in producing supramolecular chirality from achiral polymers. Here, we discuss some basic concepts, seminal studies, recent advances, the structural design principles, as well as perspectives in the construction and applications of induced chiral polymers, with the hope to advance the development of chiral chemistry.

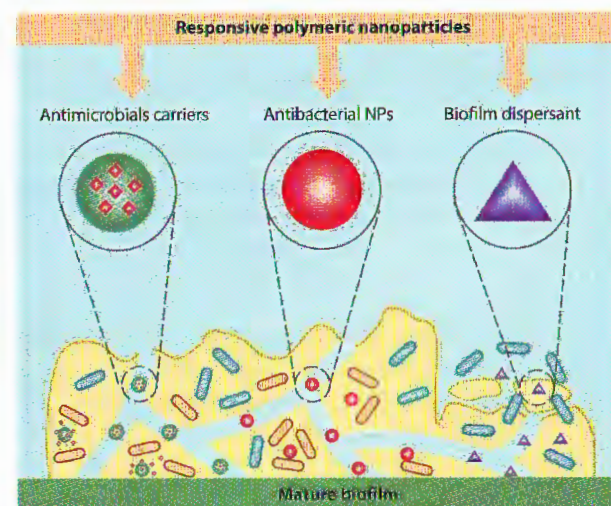


Chinese Journal of Polymer Science, 2021, 39(11), 1357–1375
<https://doi.org/10.1007/s10118-021-2561-8>

Responsive Polymeric Nanoparticles for Biofilm-infection Control

Lin-Zhu Su, Yong Liu, Yuan-Feng Li, Ying-Li An, and Lin-Qi Shi

Polymer-based materials have been applied in combating biofilm-associated infections in two major aspects. First, polymers-modified surfaces can be used to avoid bacterial adhesion and subsequently prevent biofilm formation. Besides, mature biofilms are eradicated by antimicrobials-loaded polymeric nanocarriers, polymeric nanocarriers with intrinsic antibacterial capacity, and polymeric biofilm dispersants.



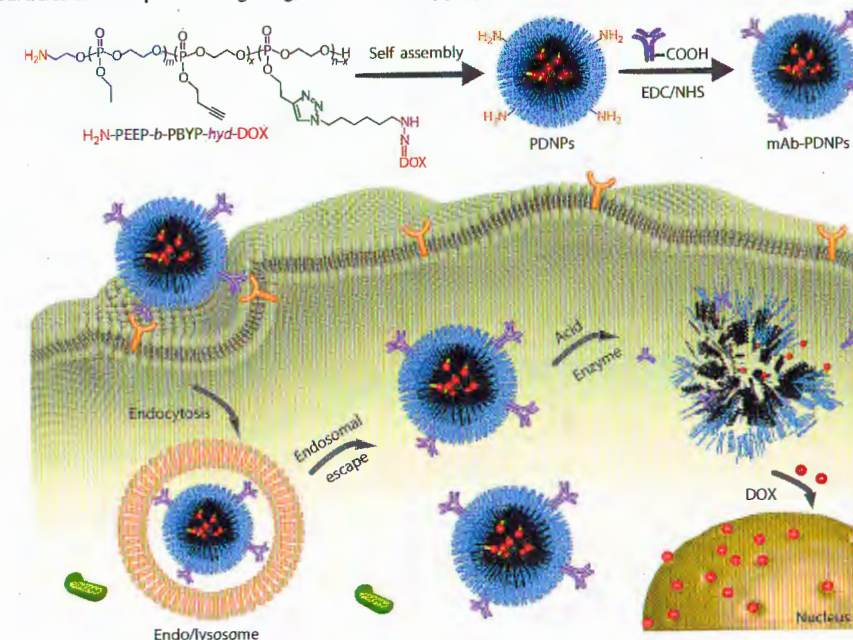
Chinese Journal of Polymer Science, 2021, 39(11), 1376–1391
<https://doi.org/10.1007/s10118-021-2610-3>

Articles

Monoclonal Antibody-conjugated Polyphosphoester-hyd-DOX Prodrug Nanoparticles for Targeted Chemotherapy of Liver Cancer Cells

Ya-Kui Huang, Hong-Rui Tian, Ming-Zu Zhang, Jin-Lin He, Jian Liu, and Pei-Hong Ni

In this work, we developed a monoclonal antibody (mAb) and polyphosphoester-hydrazide-doxorubicin prodrug conjugate, which enables the self-assembled nanoparticles to have precise targeting, tumor tissue aggregation and pH-sensitive drug release.

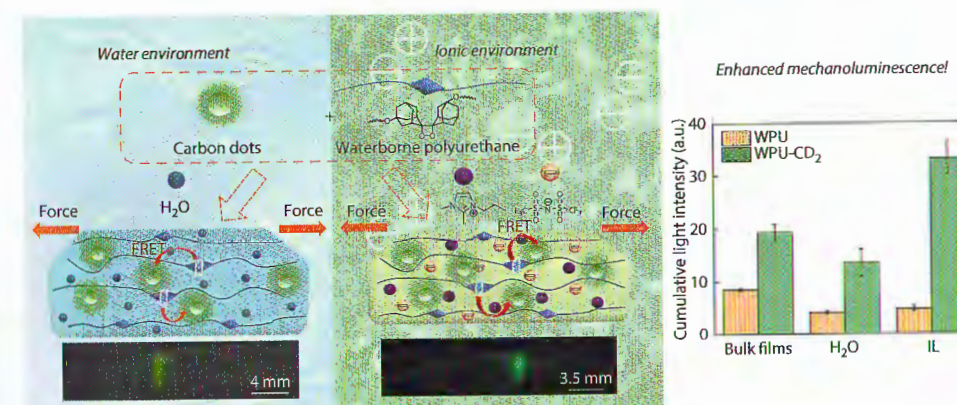


Chinese Journal of Polymer Science, 2021, 39(11), 1392–1402
<https://doi.org/10.1007/s10118-021-2582-3>

Carbon Dots Intensified Mechanochemiluminescence from Waterborne Polyurethanes as Tunable Force Sensing Materials

Bo-Han Cao, Wu Chen, Wan-Yuan Wei, Yu-Lan Chen, and Yuan Yuan

1,2-Dioxetane containing waterborne polyurethanes/carbon dots composites were synthesized, and the mechanochemiluminescence was intensified in different environments, which allowed for mapping force-induced covalent bond scission events in wetting states (water and IL) with high resolution. Particularly, multimodal strain reporting responsive at expanded strain range was realized in IL containing films.

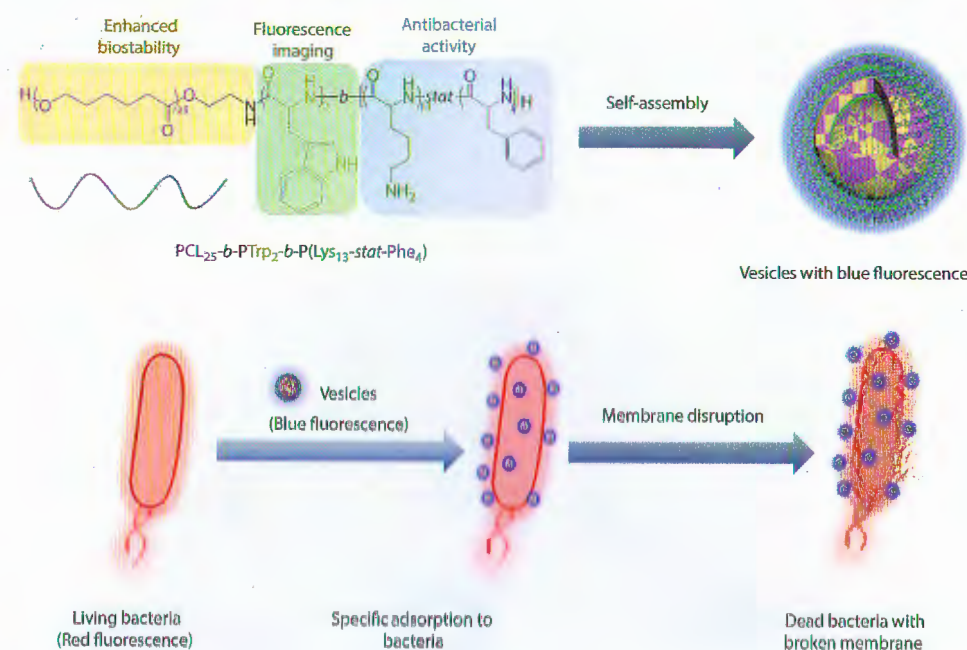


Chinese Journal of Polymer Science, 2021, 39(11), 1403–1411
<https://doi.org/10.1007/s10118-021-2601-4>

Biodegradable Polypeptide-based Vesicles with Intrinsic Blue Fluorescence for Antibacterial Visualization

Yu-Ying Yang, Ling-Shan Chen, Min Sun, Cong-Yu Wang, Zhen Fan, and Jian-Zhong Du

Polypeptide-based copolymers self-assemble into vesicles with blue emission so that the interactions between vesicles and bacteria during antimicrobial process can be observed through confocal fluorescent imaging.



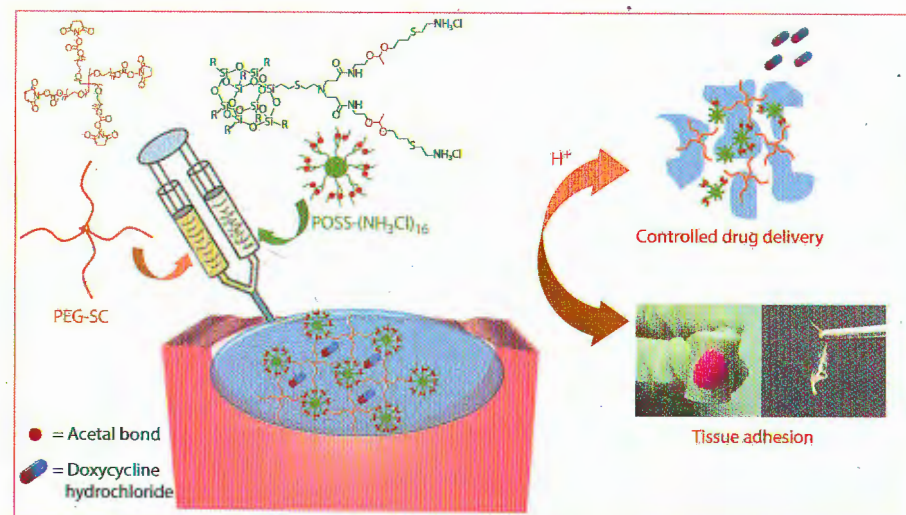
Chinese Journal of Polymer Science, 2021, 39(11), 1412–1420

<https://doi.org/10.1007/s10118-021-2593-0>

Dendrimer-based Hydrogels with Controlled Drug Delivery Property for Tissue Adhesion

Ya-Qiang Wang, Xue-Yu Dou, Hu-Fei Wang, Xing Wang, and De-Cheng Wu

A type of hydrogel adhesive was fabricated by polyacetal dendrimer G1'-[NH₃Cl]₁₆ and multi-armed PEG via the acidic acetal linkage, exhibiting a pH-responsive behavior for drug delivery system and outstanding adhesive property for porcine skin and neural tissues.



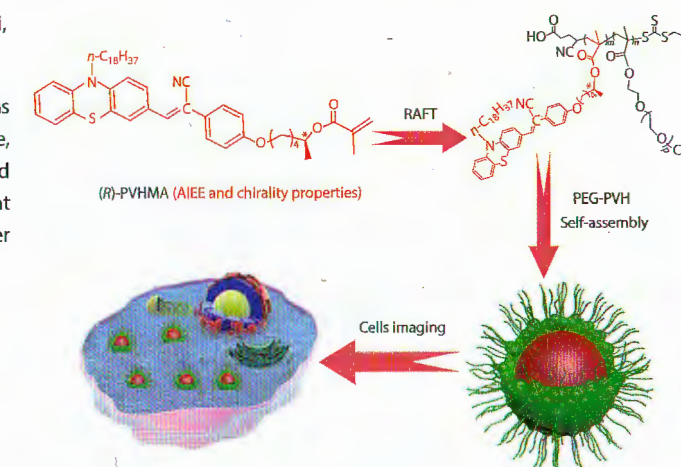
Chinese Journal of Polymer Science, 2021, 39(11), 1421–1430

<https://doi.org/10.1007/s10118-021-2584-1>

Polymerizable AEE-active Dye with Optical Activity for Fluorescent Nanoparticles Based on Phenothiazine: Synthesis, Self-assembly and Biological Imaging

Zeng-Fang Huang, Ya-Li Chen, Chao-Yue Zhou, Yan-Hong Li, Mei Li, Xiao-Bo Liu, Liu-Cheng Mao, Jin-Ying Yuan, Lei Tao, and Yen Wei

A novel polymerizable AEE-active dye with optical activity was successfully synthesized based on phenothiazine for the first time, and its amphiphilic copolymers via RAFT polymerization exhibited good fluorescence with long-wave emission, and excellent biocompatibility with uniform spherical morphology in water solution, making them promising for bioimaging applications.



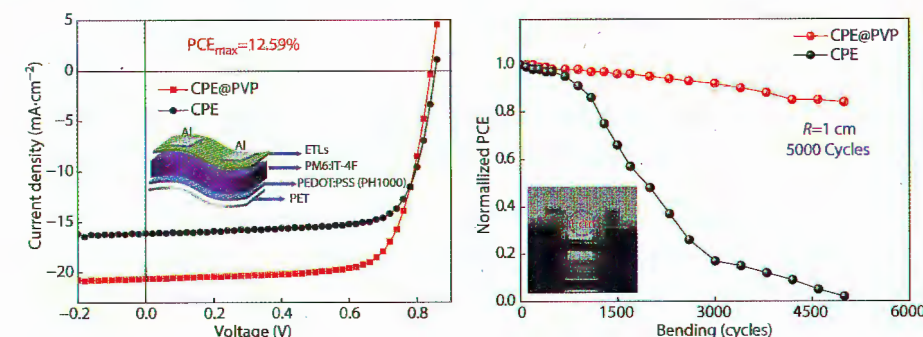
Chinese Journal of Polymer Science, 2021, 39(11), 1431–1440

<https://doi.org/10.1007/s10118-021-2596-x>

Bending-stability Interfacial Layer as Dual Electron Transport Layer for Flexible Organic Photovoltaics

Guodong Xu, Xiaotian Hu, Xunfan Liao, and Yiwang Chen

A novel bending-stability composite is explored and successfully applied as electron transport layers for fully-flexible OPVs. Compared to the bare conjugated electrolytes (CPE), the PVP modified CPE exhibit superior mechanical properties and higher power conversion efficiency (PCE). Finally, an excellent PCE of 12.59% is obtained for the fully-flexible OPVs.



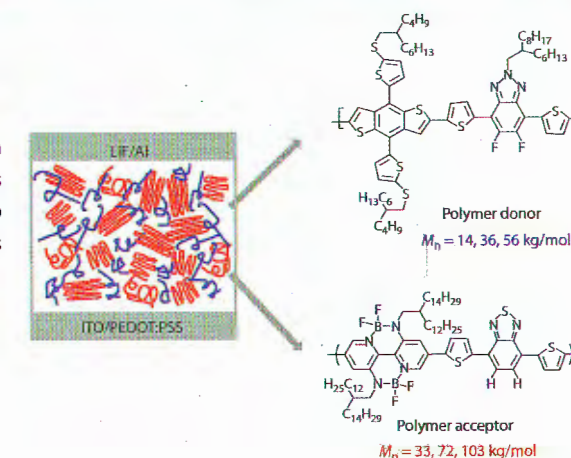
Chinese Journal of Polymer Science, 2021, 39(11), 1441–1448

<https://doi.org/10.1007/s10118-021-2586-z>

Active Layer Morphology Engineering of All-polymer Solar Cells by Systematically Tuning Molecular Weights of Polymer Donors/Acceptors

Ning Wang, Ying-Jian Yu, Ru-Yan Zhao, Ji-Dong Zhang, Jun Liu, and Li-Xiang Wang

The effect of molecular weights of the polymer donor and polymer acceptor on morphology and photovoltaic performance of all-polymer solar cells was systematically studied. This work provides a comprehensive and deep understanding of the matching of M_n of polymer donors and polymer acceptors in high-performance all-polymer solar cells.



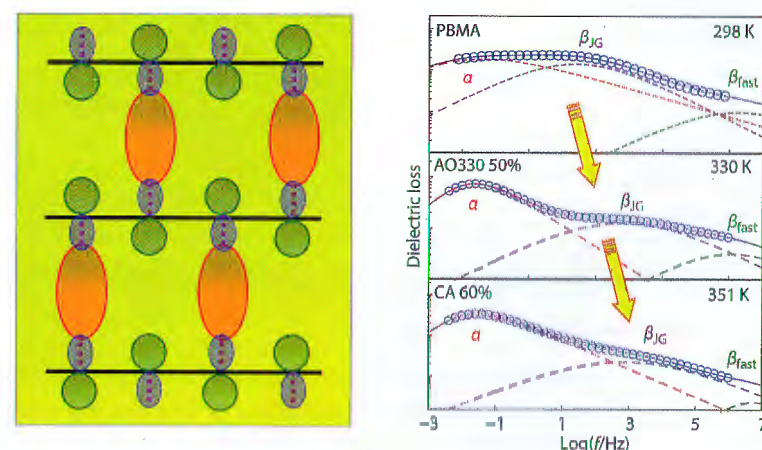
Chinese Journal of Polymer Science, 2021, 39(11), 1449–1458

<https://doi.org/10.1007/s10118-021-2609-9>

Tuning the Johari-Goldstein β -Relaxation and Its Separation from α -Relaxation of Poly(*n*-alkyl methacrylate)s by Small Molecule-bridged Hydrogen Bonds

Yuan-Biao Liu, Gao-Peng Shi, and Guo-Zhang Wu

We report that the Johari-Goldstein β (β_{JG}) relaxation of poly(*n*-alkyl methacrylate)s can be tuned by adding hindered phenols. This is achieved because introducing small molecule-bridged hydrogen bonds (HBs) between polymer chains can effectively reduce the inter-chain cooperativity despite of strengthening the intermolecular interaction. However, bulky additives with a weak inter-HB strength were found to amplify the magnitude of the α , β_{JG} separation of poly(butyl methacrylate), even though experiments of α -dispersion and dynamic fragility confirmed a reduction of their coupling factor n . The counterintuitive phenomenon suggests that the crossover time t_c in the Coupling Model is no longer a universal quantity if the inter-chain of polymers is strengthened by HBs.



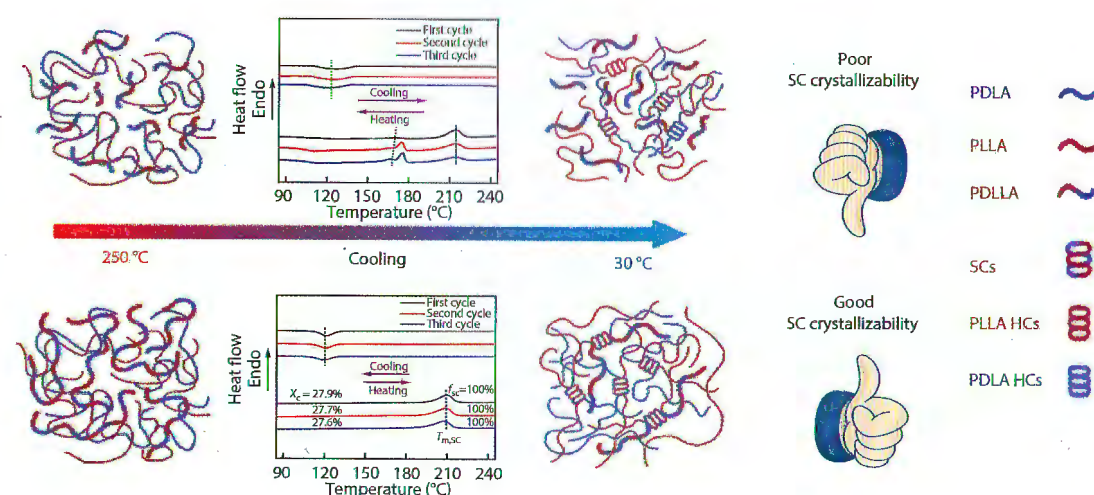
Chinese Journal of Polymer Science, 2021, 39(11), 1459–1469

<https://doi.org/10.1007/s10118-021-2595-y>

Mixing of Racemic Poly(L-lactide)/Poly(D-lactide) Blend with Miscible Poly(D,L-lactide): Toward All Stereocomplex-type Polylactide with Strikingly Enhanced SC Crystallizability

Yi-Long Ju, Xiang-Li Li, Xing-Yuan Diao, Hong-Wei Bai, Qin Zhang, and Qiang Fu

Miscible PDLLA has been successfully used to substantially enhance the SC crystallizability of linear high-molecular-weight PLLA/PDLA blends by increasing the intermolecular interactions as a sustainable compatibilizer. Exclusive SC crystallization can be obtained in the blends with high-content (e.g., 20 wt%) PDLLA having an M_w of above 1×10^5 g/mol.



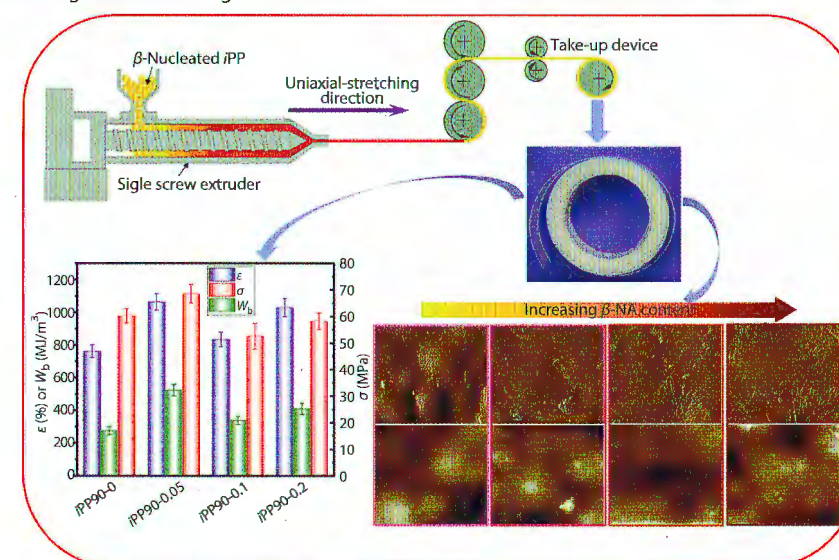
Chinese Journal of Polymer Science, 2021, 39(11), 1470–1480

<https://doi.org/10.1007/s10118-021-2588-x>

Simultaneous Enhancement of Toughness and Strength of Stretched iPP Film via Tiny Amount of β -Nucleating Agent under “Shear-free” Melt-extrusion

Zhong-Zhu Liu, Guo-Qiang Zheng, Hong-Hui Shi, Chun-Tai Liu, Li-Wei Mi, Qian Li, and Xian-Hu Liu

Isotactic polypropylene films with different β -nucleating agent contents were fabricated via a melt-extrusion-stretched technology. The tensile strength, elongation at break and strain energy density at break of iPP film with 0.05 wt% β -nucleating agent are significantly improved, indicating simultaneously enhanced toughness and strength.



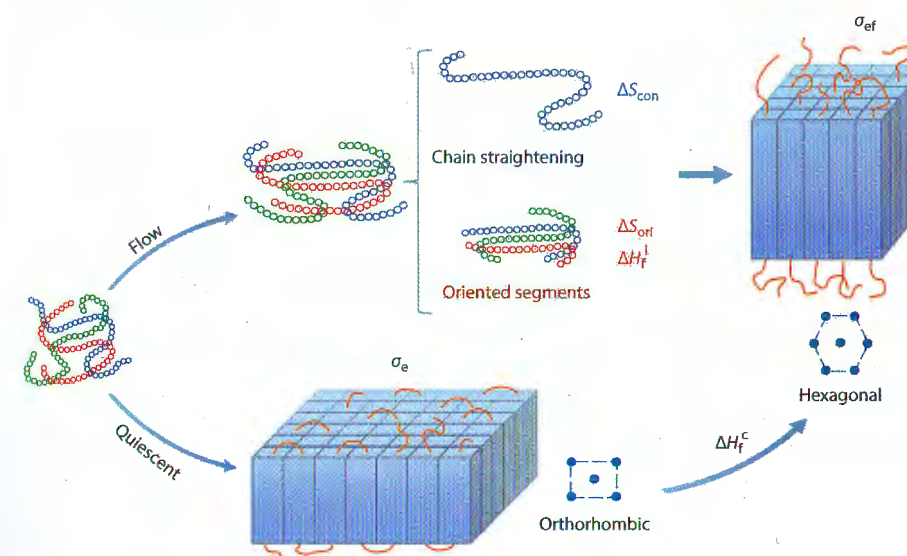
Chinese Journal of Polymer Science, 2021, 39(11), 1481–1488

<https://doi.org/10.1007/s10118-021-2589-9>

A Unified Thermodynamic Model of Flow-induced Crystallization of Polymer

Cui Nie, Fan Peng, Ting-Yu Xu, Jun-Fang Sheng, Wei Chen, and Liang-Bin Li

Considering the modified thermodynamic parameters of initial and final states under flow, we propose a uFIC model for flow-induced polymer crystallization. The model not only clarified the determinants of the critical nucleus size and accelerated nucleation, but also successfully explained the appearance of precursors and different crystal morphologies and structures under flow.



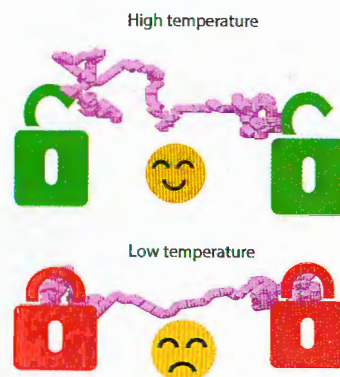
Chinese Journal of Polymer Science, 2021, 39(11), 1489–1495

<https://doi.org/10.1007/s10118-021-2622-z>

Nonlinear Viscoelasticity Raised at Low Temperatures by Intermolecular Cooperation of Bulk Amorphous Polymers

Ji-Ping Wang and Wen-Bing Hu

Dynamic Monte Carlo simulations demonstrate that at low temperatures a tentative jamming of monomers nearby two stretching ends of bulk amorphous polymers slows down the early stage of stress relaxation, causing the deviation from linear viscoelasticity.



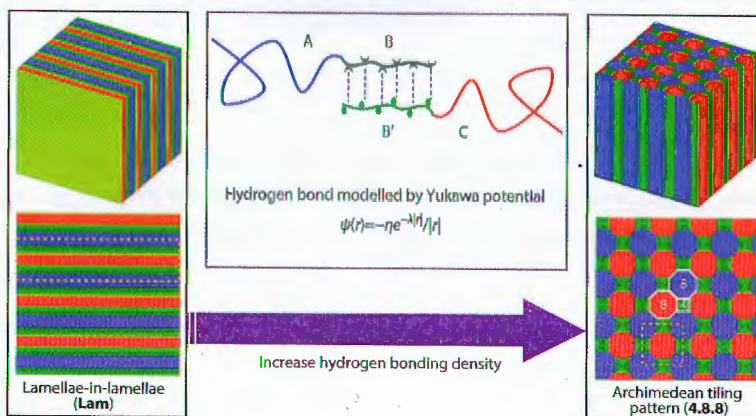
Chinese Journal of Polymer Science, 2021, 39(11), 1496–1501

<https://doi.org/10.1007/s10118-021-2624-x>

Supramolecular Self-assembly Behaviors of Asymmetric Diblock Copolymer Blends with Hydrogen Bonding Interactions between Shorter Blocks Modelled by Yukawa Potentials

Xu Zhang, Jialiang Chen, Lin Xu, and Tianxi Liu

A self-consistent field theory combined with Yukawa potential was extended to examine the supramolecular self-assembly behaviors of asymmetric diblock copolymer blends with hydrogen bonding interactions between shorter blocks. The phase transition from parallelly packed lamellae-in-lamellae to 4.8.8 Archimedean tiling pattern was observed as hydrogen bonding density increases.



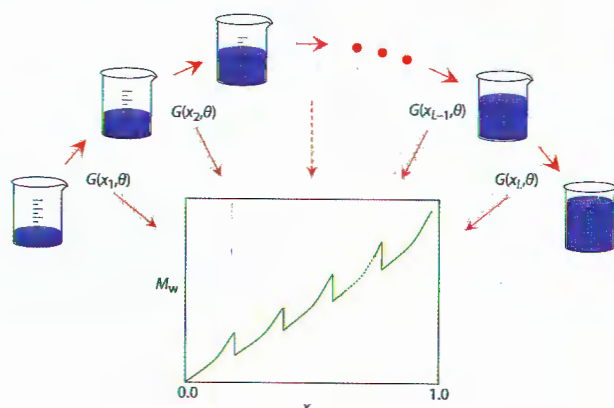
Chinese Journal of Polymer Science, 2021, 39(11), 1502–1509

<https://doi.org/10.1007/s10118-021-2591-2>

A Unified Theoretical Treatment on Statistical Properties of the Semi-batch Self-condensing Vinyl Polymerization System

Fang Gu, Jiang-Tao Li, Xiao-Zhong Hong, and Hai-Jun Wang

A novel generation function for the semi-batch self-condensing vinyl polymerization system is explicitly proposed to calculate average properties of polymers. The derived analytical expressions of average polymeric quantities in each step are associated with a general function depending only on the initial conditions of the reaction step.



Chinese Journal of Polymer Science, 2021, 39(11), 1510–1520

<https://doi.org/10.1007/s10118-021-2603-2>