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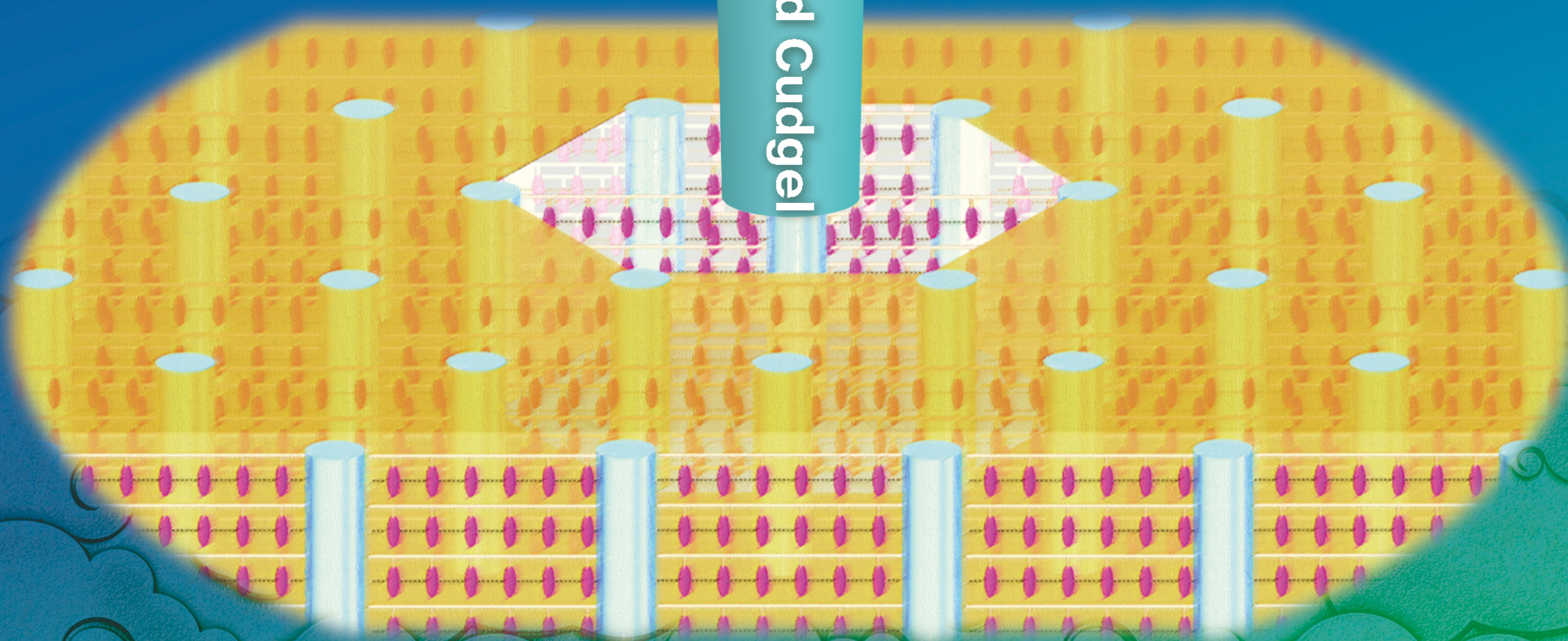
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As-You-Wish Gold-Banded Cudgel



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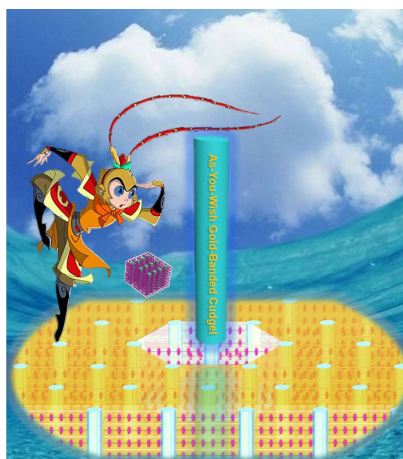
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Cover Image

Macroscopic Regulation of Hierarchical Nanostructures in Liquid-crystalline Block Copolymers towards Functional Materials

Feng Cai, Yu-Xuan Chen, Wen-Zhong Wang, and Hai-Feng Yu

The image shows regularly ordered nanostructures self-assembled in liquid-crystalline block copolymers with the help of liquid-crystalline ordering. Such regular arrays of nanocylinders are easily fabricated with excellent reproducibility and mass production under supramolecular cooperative motion. These can be imaged as “As-You-Wish Gold-Banded Cudgel”, the weapon used by the Monkey King in the famous classic literary novel <Pilgrimage to the West>.



Chinese Journal of Polymer Science, 2021, 39(4), 397–416

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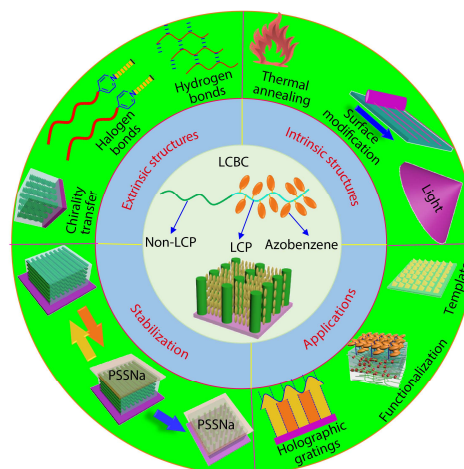
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Reviews

Macroscopic Regulation of Hierarchical Nanostructures in Liquid-crystalline Block Copolymers towards Functional Materials

Feng Cai, Yu-Xuan Chen, Wen-Zhong Wang, and Hai-Feng Yu

Compared to conventional block copolymers (BCs), photoresponsive liquid-crystalline block copolymers (LCBCs) have substantial advantages since their supramolecularly self-assembled nanostructures can be manipulated by light. Recent advances show these LCBCs are excellent candidates for nanotemplates and nanofabrication materials. This review highlights the macroscopic regulation of hierarchical nanostructures in LCBCs towards functional materials.



Chinese Journal of Polymer Science, 2021, 39(4), 397–416

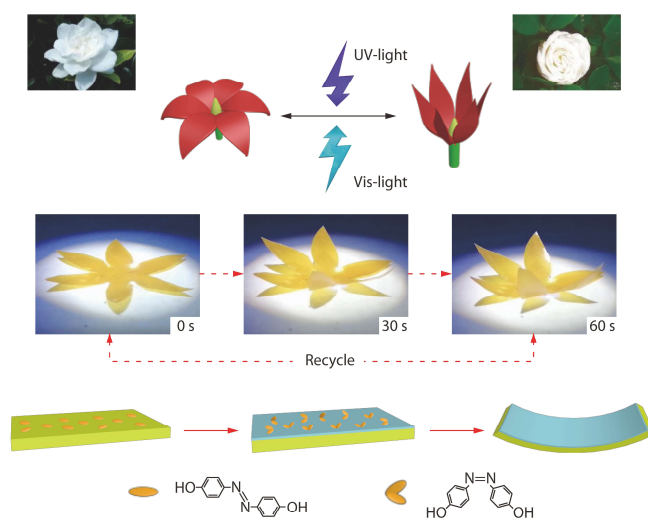
<https://doi.org/10.1007/s10118-021-2531-1>

Articles

Azobenzene Based Photo-responsive Mechanical Actuator Fabricated by Intermolecular H-bond Interaction

Chun-Yan Yu, Jia-Hui Mu, Yun-Lei Fu, Yun-Chao Zhang,
Ji-Shu Han, Rui-Yang Zhao, Jia Zhao, Zi-Hao Wang,
Zhong-Cheng Zhao, Wei-Jun Li, and Fu-Sheng Liu

The photo-responsive mechanical actuator is fabricated by H-bond between 4,4'-dihydroxyazobenzene and chitosan *via* the facile solvent evaporation method which is appropriate for large-scale manufacturing industrialization. The composite film can lift 200 times its own weight due to the good mechanical and photo-induced macroscopic transformation properties.

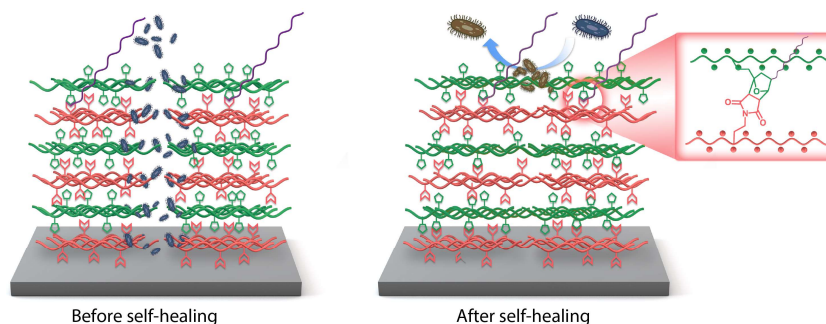


Chinese Journal of Polymer Science, 2021, 39(4), 417–424
<https://doi.org/10.1007/s10118-021-2504-4>

Robust and Self-healable Antibiofilm Multilayer Coatings

Chao Zhou, Jun-Tao Zhou, Cheng-Ju Sheng, Dicky Pranantyo, Yan Pan, and Xiao-Jia Huang

The crossed multilayer coatings fabricated *via* LBL assembly and Diels-Alder click reaction showed robust and self-healable activity, and could significantly inhibit the bacterial growth and biofilm formation.

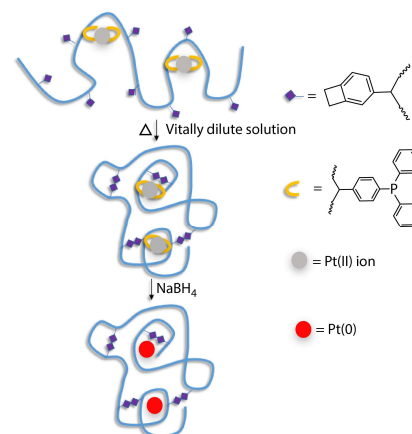


Chinese Journal of Polymer Science, 2021, 39(4), 425–440
<https://doi.org/10.1007/s10118-021-2513-3>

Platinum Atoms Dispersed in Single-chain Polymer Nanoparticles

Zhi-Yu Hu, Hong-Ting Pu, and Jian-Guo Wu

In dilute solution, triphenylphosphine in polymers catches platinum ions (Pt(II)), and then the intramolecular cross-linking promotes the single-chain collapses and forms single-chain nanoparticles (SCNPs). Pt(II) in SCNPs is reduced to platinum atoms (Pt(0)). Pt(0) steadily dispersed in SCNPs exhibit better catalytic properties than platinum particles carried by normal polymers.

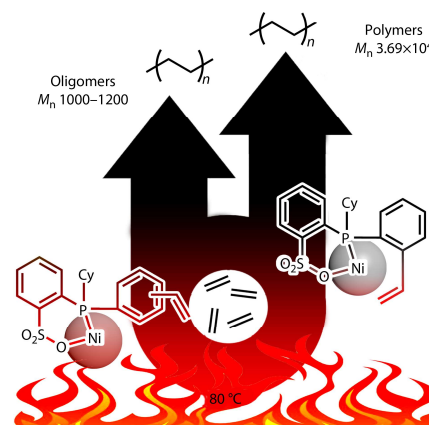


Chinese Journal of Polymer Science, 2021, 39(4), 441–446
<https://doi.org/10.1007/s10118-021-2499-x>

Styrene-containing Phosphine-sulfonate Ligands for Nickel- and Palladium-catalyzed Ethylene Polymerization

Shabnam Behzadi, Chen Zou, Bang-Pei Yang, Chen Tan, and Chang-Le Chen

The phosphine-sulfonate nickel complex bearing 2-vinylphenyl resulted in much higher thermal stability and polyethylene molecular weights ($M_n=3.69\times10^4$ g·mol⁻¹) at 80 °C compared with its counterparts bearing 3-/4-vinylphenyl groups and the phosphine-sulfonate nickel complexes bearing bulky biaryl substituents.



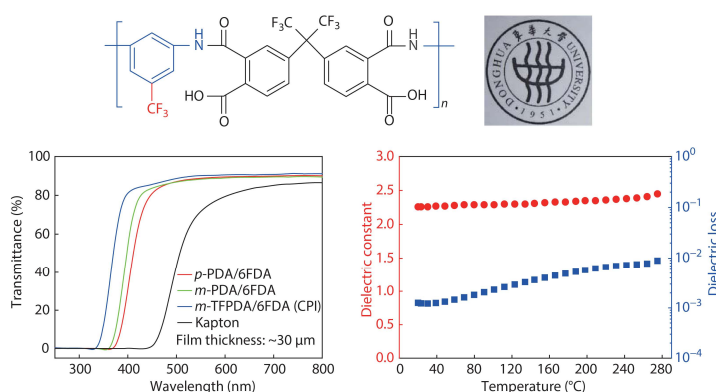
Chinese Journal of Polymer Science, 2021, 39(4), 447–454

<https://doi.org/10.1007/s10118-021-2509-z>

Highly Transparent and Colorless Polyimide Film with Low Dielectric Constant by Introducing *Meta*-substituted Structure and Trifluoromethyl Groups

Hong-Tao Zuo, Feng Gan, Jie Dong, Peng Zhang, Xin Zhao, and Qing-Hua Zhang

An easy and effective approach was reported to prepare highly transparent polyimide film with low dielectric constant by simultaneously introducing *meta*-substituted structure and trifluoromethyl groups in polymer chains, which inhibits the formation and transfer of charge transfer complex (CTC) and increases the free volume of the film.



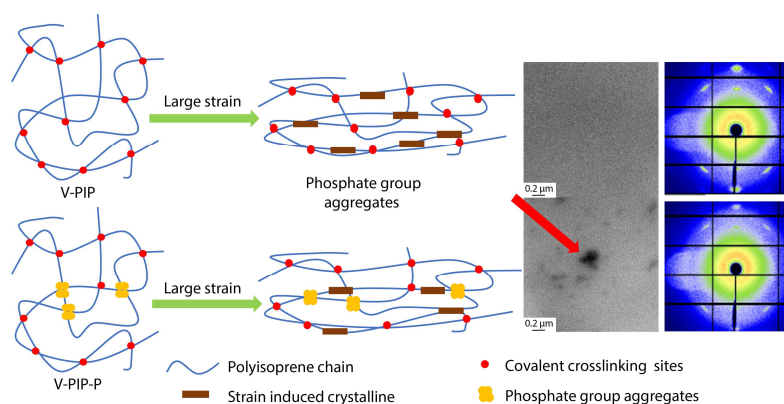
Chinese Journal of Polymer Science, 2021, 39(4), 455–464

<https://doi.org/10.1007/s10118-021-2514-2>

The Relationship between Pendant Phosphate Groups and Mechanical Properties of Polyisoprene Rubber

Shi-Qi Li, Mao-Zhu Tang, Cheng Huang, Rong Zhang, Guang-Su Huang, and Yun-Xiang Xu

Pendant phosphate groups in vulcanized polyisoprene matrix aggregate to construct additional dynamic cross-linking sites, which not only increase the network density and mechanical strength, but also reduce the onset of strain-induced crystallization (SIC) and hinder the crystal growth.



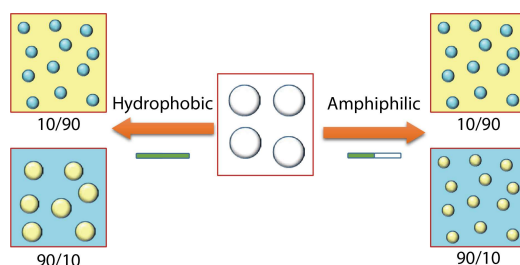
Chinese Journal of Polymer Science, 2021, 39(4), 465–473

<https://doi.org/10.1007/s10118-021-2497-z>

Coalescence Suppression in Flowing Polymer Blends Using Silica Rods with Different Surface Chemistries

Si-Ying Xiang, Li-Sa-Ya Ye, Ya-Jiang Huang, Ya-Dong Lv, Mi-Qiu Kong, and Guang-Xian Li

Compared with rods with homogenous surface chemistry, amphiphilic rods were found to display similar compatibilization efficiencies toward flowing polymer blends with different blend ratios due to their multiple compatibilization mechanisms. As a result, strict formulations were not required when amphiphilic rods were employed as compatibilizers.



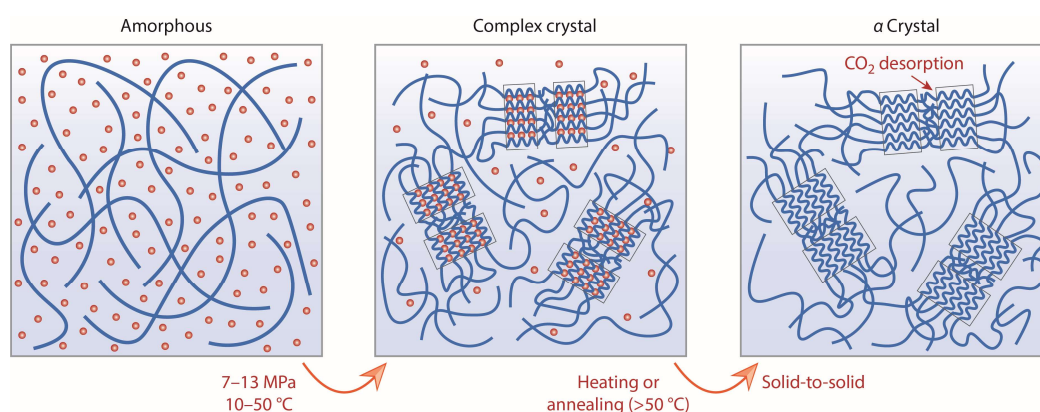
Chinese Journal of Polymer Science, 2021, 39(4), 474–483

<https://doi.org/10.1007/s10118-021-2526-y>

Temperature-dependent Crystallization and Phase Transition of Poly(L-lactic acid)/CO₂ Complex Crystals

Ying Zheng, Cai-Liang Zhang, Yong-Zhong Bao, Guo-Rong Shan, and Peng-Ju Pan

PLLA crystallized in PLLA/CO₂ complex crystals under 7–13 MPa CO₂ at $T_c \leq 50$ °C. The complex crystals were metastable and transformed into thermally stable α crystals with the desorption of CO₂ via solid-to-solid route during heating or annealing at the temperature above 50 °C.



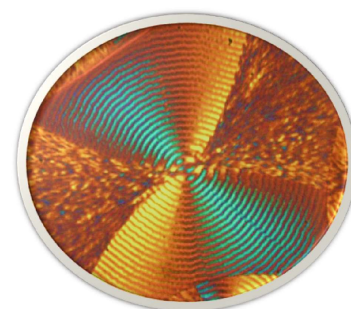
Chinese Journal of Polymer Science, 2021, 39(4), 484–492

<https://doi.org/10.1007/s10118-021-2502-6>

Unusual Spherulitic Morphology of Poly(propylene fumarate)

Xiao-Yu Meng, Yi Li, Shu-Fang Yao, Xue-Wei Wei, and Hai-Mu Ye

The complicated spherulitic morphology of poly(propylene fumarate), which is sensitive to crystallization temperature and displays varying apparent crystallinity detected by FTIR, is correlated to the change of growth axis along radial direction, and the growth mechanism is reasonably speculated.



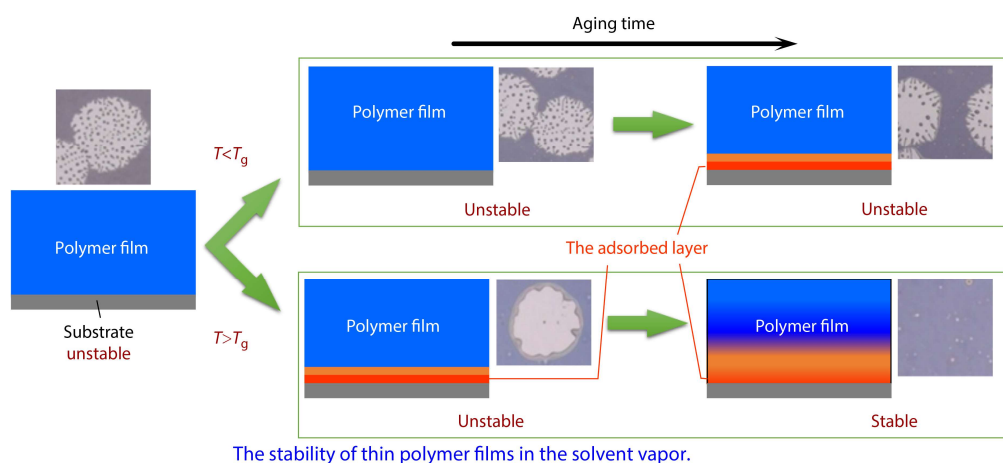
Chinese Journal of Polymer Science, 2021, 39(4), 493–500

<https://doi.org/10.1007/s10118-021-2518-y>

Effect of Interfacial Adsorption on the Stability of Thin Polymer Films in a Solvent-induced Process

Lin Xu, Tong-Fei Shi, Li-Jia An, Yu-Yuan Lu, and Li-Na Wang

We investigate the stability mechanism of thin polymer films in the solvent-induced process. The results show that the formation of the adsorbed layer at $T_{\text{aging}} > T_g$ can greatly reduce the short-range polar interaction of the thin film system and suppress the instability of thin polymer films in the solvent-induced process.



The stability of thin polymer films in the solvent vapor.

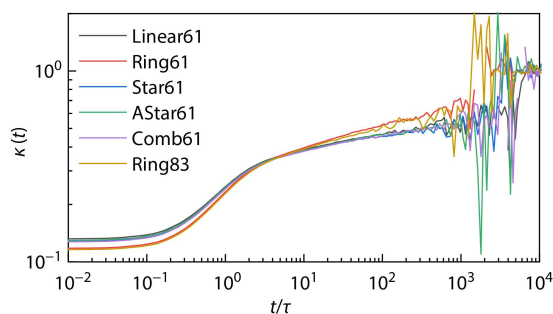
Chinese Journal of Polymer Science, 2021, 39(4), 501–511

<https://doi.org/10.1007/s10118-020-2493-8>

Combined Molecular Dynamics Simulation and Rouse Model Analysis of Static and Dynamic Properties of Unentangled Polymer Melts with Different Chain Architectures

Pu Yao, Lu-Kun Feng, and Hong-Xia Guo

The Rouse assumptions about chain conformation and dynamics of unentangled chains with different architectures are investigated. We find the excluded volume effect domain is the main effect for open-like chains and the nonconcatenated condition is an additional constraint for rings. The cross-correlation contribution of ring polymers is different from that of open-like chains.



Chinese Journal of Polymer Science, 2021, 39(4), 512–524

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