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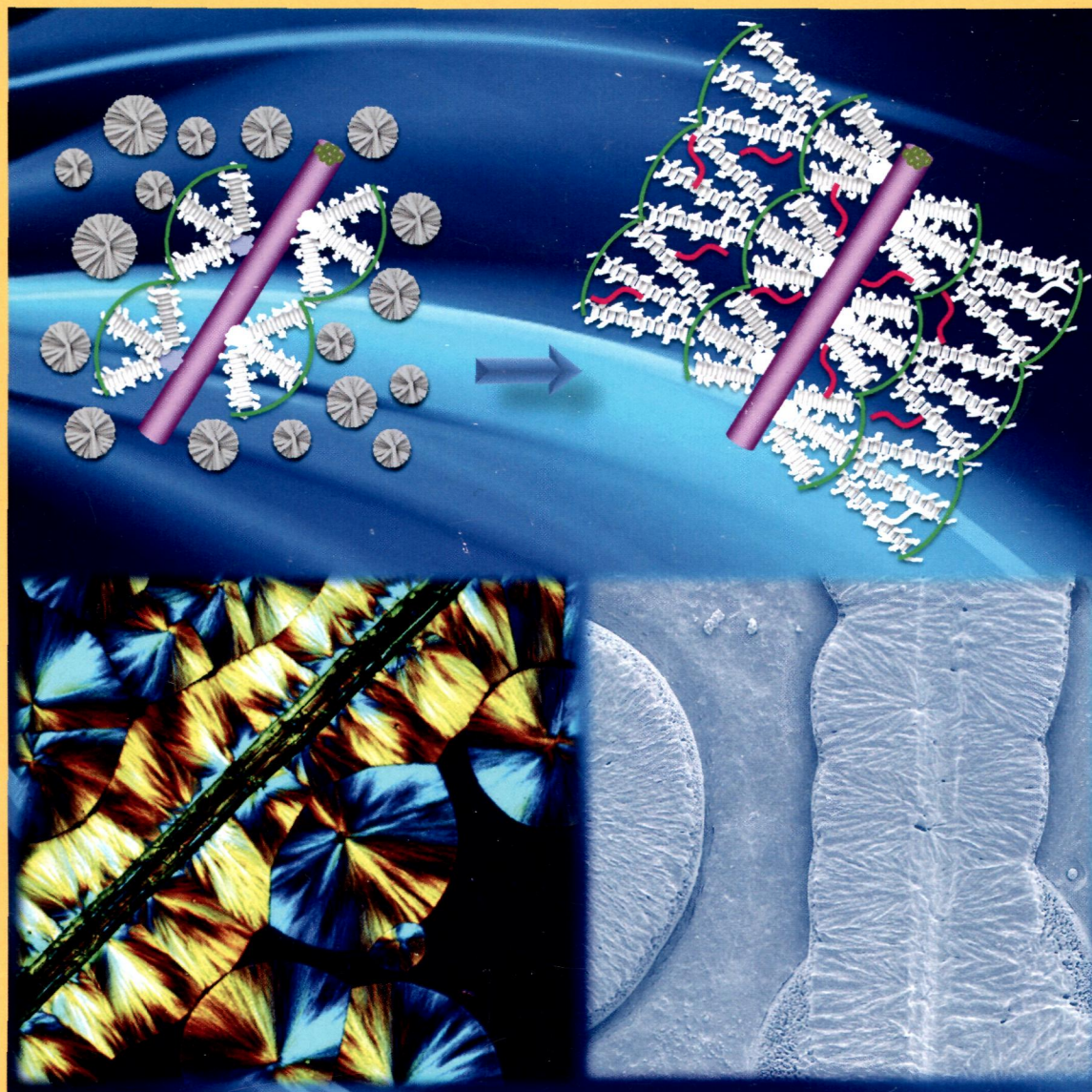
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**Strong Transcrystalline
Layers Formed in
Poly(L-lactic acid)
Biocomposites with
an Accelerator of
Chain Mobility
(see page 5A)**

BIOPHYSICAL CHEMISTRY, BIOMATERIALS, LIQUIDS, AND SOFT MATTER



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ON THE COVER: Strong transcrystalline layers formed in poly(L-lactic acid) biocomposites with an accelerator of chain mobility. Formation of the transcrystalline layer probably enhances the interfacial adhesion of poly(L-lactic acid) (PLLA)/natural fiber biocomposites, as confirmed by this work. It was of great interest to reveal that a crystallization accelerator, poly(ethylene glycol) (PEG), enabled the PLLA chains' desirable mobility and, thus, enhanced the transcrystallization kinetics induced by ramie fibers. The direct observation of polarized optical microscopy during isothermal crystallization suggested that large-sized transcrystallinity (TC) featured by impressive growth rates was produced after adding PEG. It could be exemplified by the case at 125 °C, the growth rate of TC developed in PLLA10 (containing 10 wt % PEG) achieved 6.1 $\mu\text{m}/\text{min}$, which was nearly triple that of pure PLLA (2.1 $\mu\text{m}/\text{min}$). Another desirable feature distinguishing the modified system from pure PLLA is that spherulitic nucleation's proceeding was largely restricted because it was difficult to fulfill the critical size for stable nuclei due to the increased chain mobility. Meanwhile, combining the effective nucleation activity of the ramie fibers and the acceleration merits of PEG offered the chance to form the prevailing TC texture instead of the rich spherulites that dominate in pure PLLA. The local structure (including the lamellar structure and molecular orientation) of transcrystalline layers was further determined, which indicated that the TC presented the α crystal form and random lamellar packing derived from the moderate nucleating ability. Importantly, the single fiber reinforced composite samples containing the prevailing TC textures achieved remarkably higher interfacial strength compared with that of pure PLLA samples with poorly developed transcrystalline layers. See page 812.


Articles

Biophysical Chemistry and Biomolecules

649  [dx.doi.org/10.1021/jp4074587](https://doi.org/10.1021/jp4074587)

Modeling of Peptaibol Analogues Incorporating Nonpolar α,α -Dialkyl Glycines Shows Improved α -Helical Preorganization and Spontaneous Membrane Permeation

Tarsila G. Castro and Nuno M. Micaêlo*

659  [dx.doi.org/10.1021/jp408584v](https://doi.org/10.1021/jp408584v)

Chromophore Dynamics in the PYP Photocycle from Femtosecond Stimulated Raman Spectroscopy

Mark Creelman, Masato Kumauchi, Wouter D. Hoff, and Richard A. Mathies*

668  [dx.doi.org/10.1021/jp4087199](https://doi.org/10.1021/jp4087199)

Determination of the Triple Helical Chain Conformation of β -Glucan by Facile and Reliable Triple-Detector Size Exclusion Chromatography

Sheng Li, Yao Huang, Sen Wang, Xiaojuan Xu, and Lina Zhang*

676  [dx.doi.org/10.1021/jp4093964](https://doi.org/10.1021/jp4093964)


O₂ Migration Rates in [NiFe] Hydrogenases. A Joint Approach Combining Free-Energy Calculations and Kinetic Modeling

J r mie Topin, Julien Diharce, S bastien Fiorucci, Serge Antonczak,* and J r me Golebiowski*


682  dx.doi.org/10.1021/jp409660b
Watson–Crick and Sugar-Edge Base Pairing of Cytosine in the Gas Phase: UV and Infrared Spectra of Cytosine-2-Pyridone
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692 dx.doi.org/10.1021/jp4101569
Long-Range Electron Transfer with Myoglobin Immobilized at Au/Mixed-SAM Junctions: Mechanistic Impact of the Strong Protein Confinement
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724  dx.doi.org/10.1021/jp410299x
Intergrowth and Interfacial Structure of Biomimetic Fluorapatite–Gelatin Nanocomposite: A Solid-State NMR Study
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731 dx.doi.org/10.1021/jp406651f
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743  dx.doi.org/10.1021/jp408439j
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Interface-Limited Growth of Heterogeneously Nucleated Ice in Supercooled Water
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761 dx.doi.org/10.1021/jp410090f
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771 dx.doi.org/10.1021/jp410261k
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783 dx.doi.org/10.1021/jp412365n
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791  dx.doi.org/10.1021/jp406598x
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800  dx.doi.org/10.1021/jp408282x
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Chester A. Faunce and Henrich H. Paradies*

812 dx.doi.org/10.1021/jp409021q
Toward Stronger Transcrystalline Layers in Poly(L-lactic acid)/Natural Fiber Biocomposites with the Aid of an Accelerator of Chain Mobility
Huan Xu, Lan Xie, Xin Jiang, Xu-Juan Li, Yue Li, Zi-Jing Zhang, Gan-Ji Zhong,* and Zhong-Ming Li*

824  dx.doi.org/10.1021/jp409626s
Manipulation of the Gel Behavior of Biological Surfactant Sodium Deoxycholate by Amino Acids
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833  dx.doi.org/10.1021/jp409652k
Toward a Rational Design of Bioactive Glasses with Optimal Structural Features: Composition–Structure Correlations Unveiled by Solid-State NMR and MD Simulations
Renny Mathew, Baltzar Stevansson, Antonio Tilocca, and Mattias Edén*

845  dx.doi.org/10.1021/jp4114392
Polystyrenes with Hydrophilic End Groups: Synthesis, Characterization, and Effects on the Self-Assembly of Breath Figure Arrays
Liang-Wei Zhu, Yang Ou, Ling-Shu Wan,* and Zhi-Kang Xu

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