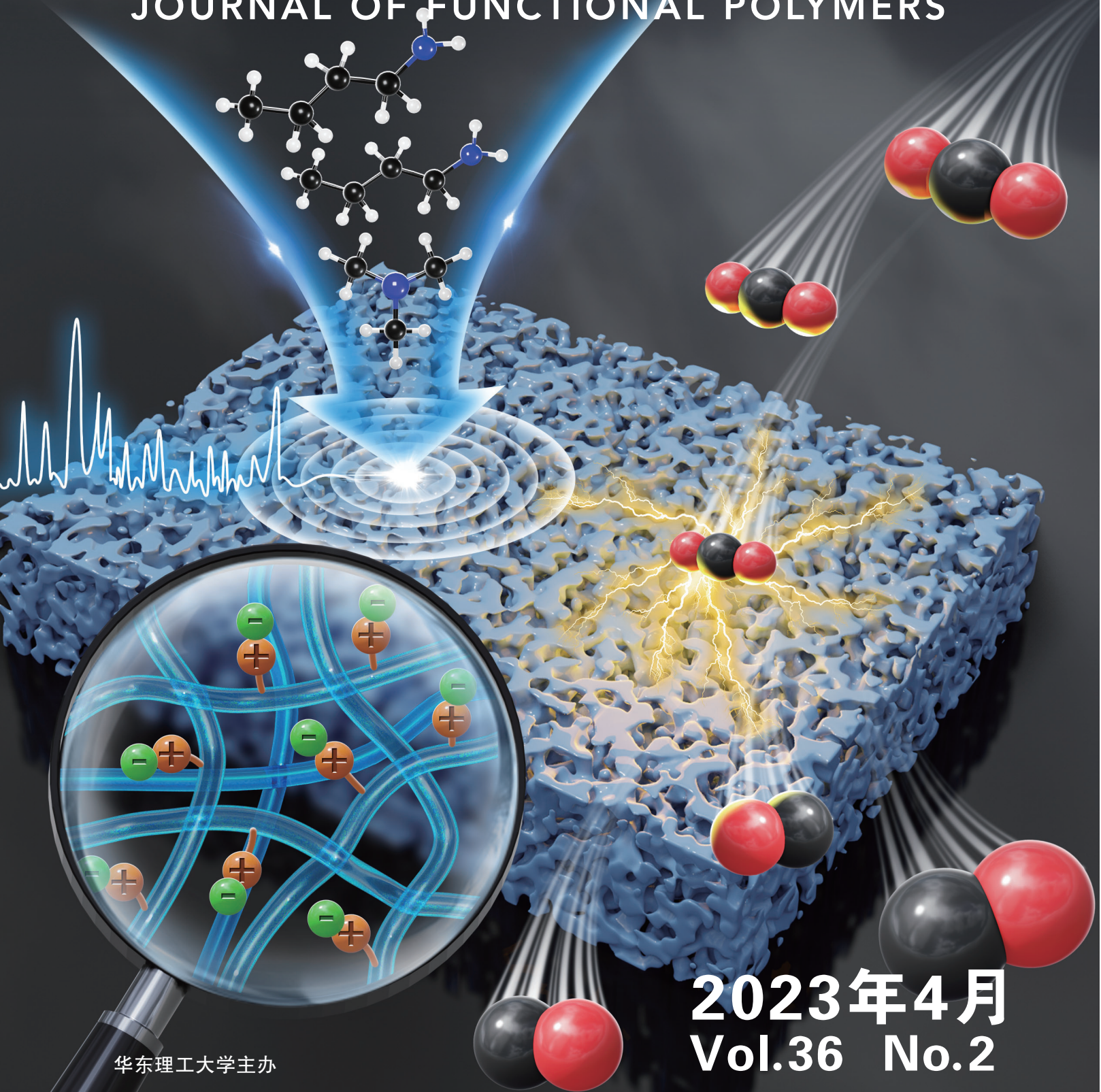


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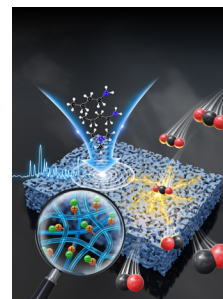
Cover Story

Research Progress of Ionic Porous Organic Polymers

HUANG Xingye, GUO Jia

Journal of Functional Polymers, 2023, 36(2) : 95–106.

Ionic porous organic polymers (i-POP) feature polyelectrolyte backbones and stable porous structures, bearing distinct superiority over neutral porous materials and holding great promise for various application fields. With the ongoing progress achieved in recent years, this review summarizes the design principles, synthesis, and applications for such materials systematically and provides an outlook on the challenges encountered in their exploration.



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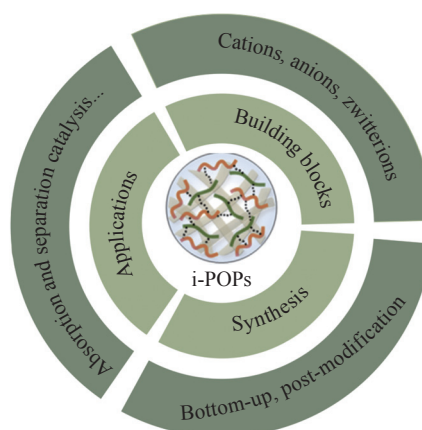
Invited Reviews

Research Progress of Ionic Porous Organic Polymers

HUANG Xingye, GUO Jia

Journal of Functional Polymers, 2023, 36(2) : 95–106.

Ionic porous organic polymer (i-POP) is an emerging class of organic porous polyelectrolytes with ionized backbones or side groups on the skeletons, featuring high specific surface areas, designable regulation and high charge density, thus showing potential in unique applications. The recent researches on i-POP in terms of molecular design, synthesis methods, and applications in adsorption and separation, catalysis and other fields are discussed in this review.



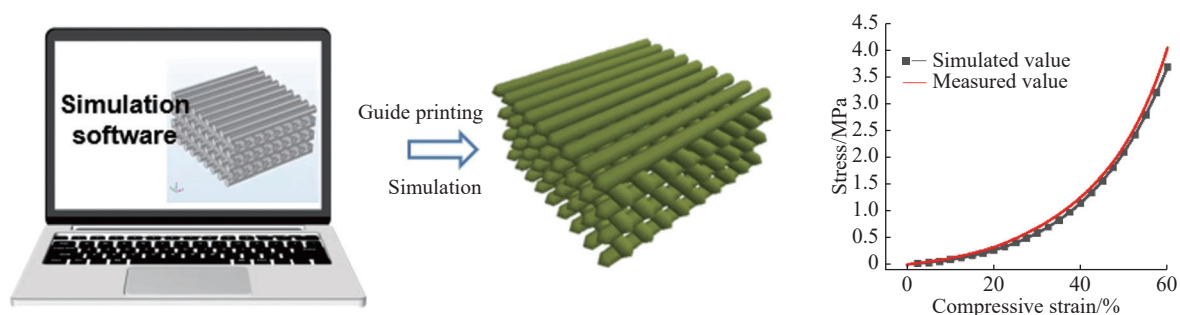
Papers

Development of Silk Fibroin Based Bio-Ink for Tough Scaffold and Related Simulation Software for 3D Printing Scaffold

GENG Yanan, ZHAO Menglu, YAO Xiang, ZHANG Yaopeng

Journal of Functional Polymers, 2023, 36(2) : 107–116.

A silk fibroin based bio-ink for tough scaffold and related simulation software for 3D printing scaffold have been developed. The printed scaffold showed good cytocompatibility and excellent mechanical properties. Model files can be outputted from the software for scaffolds printing, predicting their compressive mechanical properties.

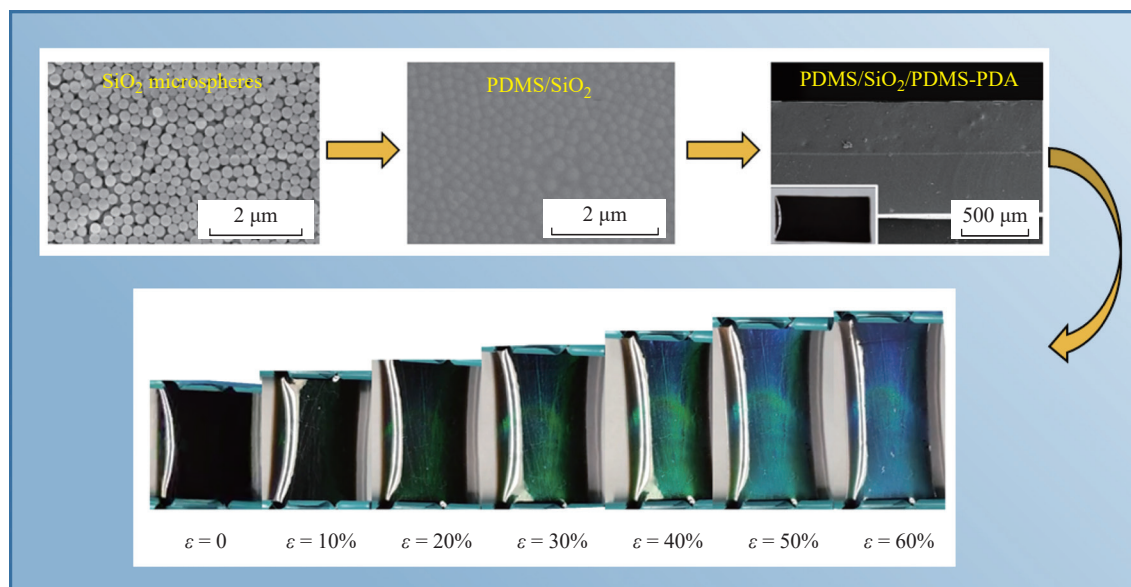


Photonic Elastomer Films Constructed by PDMS/SiO₂/PDMS-PDA via Fast Lifting Method

HE Yuqing, WU Youping

Journal of Functional Polymers, 2023, 36(2) : 117–125.

Long-range disordered and short-range ordered SiO₂ amorphous photonic crystal templates were obtained via fast lifting method, and the sandwich structure photonic elastomer films were prepared using the templates. The films exhibit good mechanochromic properties, and their structural color can take blue-shift with the increase of tensile strain.

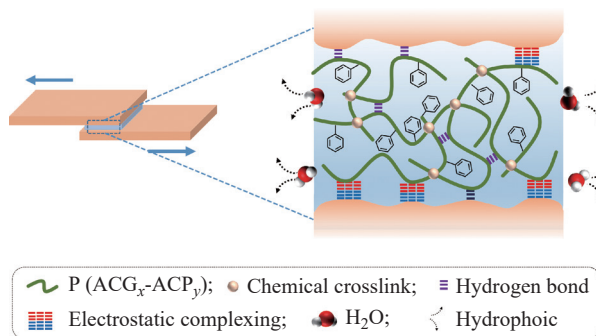


Preparation and Adhesion Properties of Bio-Hydrogels with Hydrophilic-Hydrophobic Double Networks

ZHANG Kena, ZHOU Jiahua, DU Deyan, NI Zhongbin, CHEN Mingqing, SHI Dongjian

Journal of Functional Polymers, 2023, 36 (2) : 126–135.

P(ACG_x-ACP_y) hydrogel constructed with hydrogen bond and chemical cross-linking double network has excellent wet adhesion performance. The enriched carboxyl group on the surface of hydrogel can form hydrogen bond and electrostatic interactions with pig skin, and the maximum wet adhesion strength of pig skin can reach 80.2 kPa.

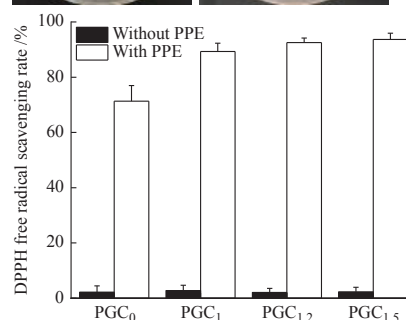
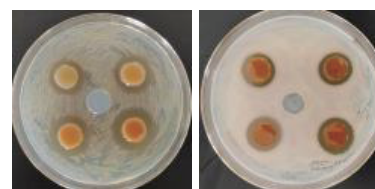


Preparation of Polyvinyl Alcohol Hydrogel Wound Dressing Loaded With Pomegranate Peel Extract

ZHAO Zhongnan, ZHANG Xingqun, ZHAI Zhihao, HE Mingyu, XIA Xin, WANG Ying

Journal of Functional Polymers, 2023, 36 (2) : 136–145.

Pomegranate peel extract (PPE) was added to polyvinyl alcohol (PVA) and sodium carboxymethyl cellulose (Na-CMC) to prepare transparent hydrogel wound dressing. PPE improved the properties of hydrogels and endowed hydrogel with excellent antibacterial and antioxidant properties.



Synthesis and Characterization of Photocrosslinked Nonlinear Optical Polymers Based on Anthracene Groups

MA Hui, LI Ming

Journal of Functional Polymers, 2023, 36 (2) : 146–152.

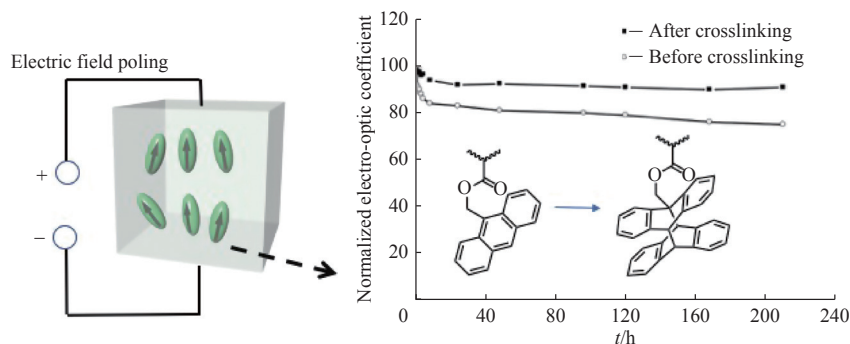
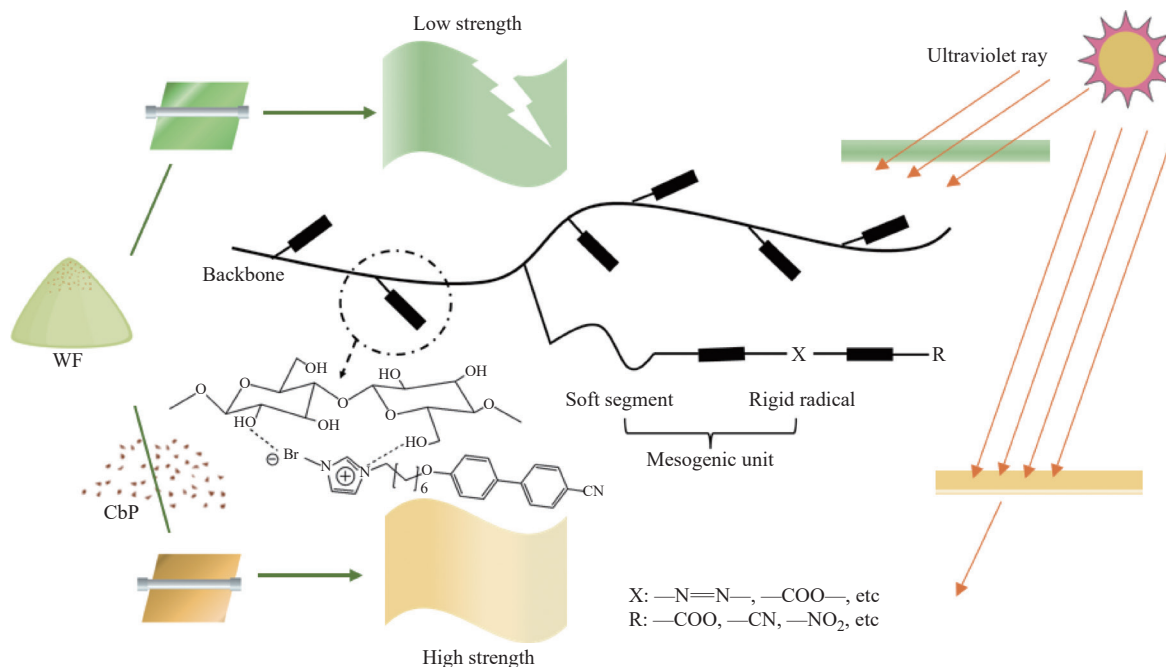


Photo crosslinkable anthracene group were introduced to second-order nonlinear optical materials for improving alignment stability by [4+4] cycloaddition. At the same time, photocrosslinking reaction could be initiated by hand portable UV light after electric field poling, which could prevent light bleaching of chromophore.

Preparation and UV Resistance of Biphenyl Liquid Crystal Modified Cellulose Film

LI Junwei, SONG Jun, CAO Lele, SHAO Chenghao, SHI Yufei

Journal of Functional Polymers, 2023, 36 (2) : 153–159.



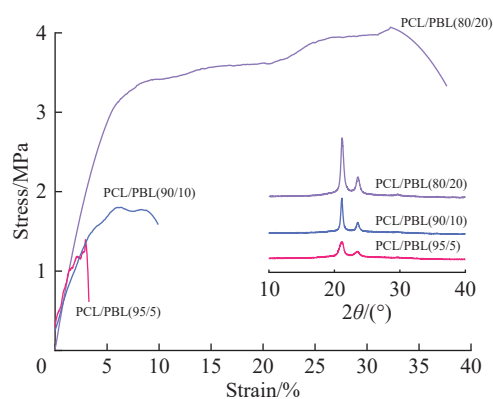
Ionic liquid 1-allyl-3-methylimidazolium chloride (AMIM•Cl) was used as a solvent to prepare polymer solution by adding cellulose and liquid crystal elements. The cellulose liquid crystal film with high strength, high flexibility and ultraviolet resistance was prepared by impregnating precipitation phase conversion technology with the liquid crystal. This excellent cellulose liquid crystal film has potential application value in the field of high strength packaging.

Preparation and Properties of PCL/PBL Electrospun Fibers

MING Yuan, CHEN Tao, ZHAO Liming, QIU Yongjun

Journal of Functional Polymers, 2023, 36 (2) : 160–169.

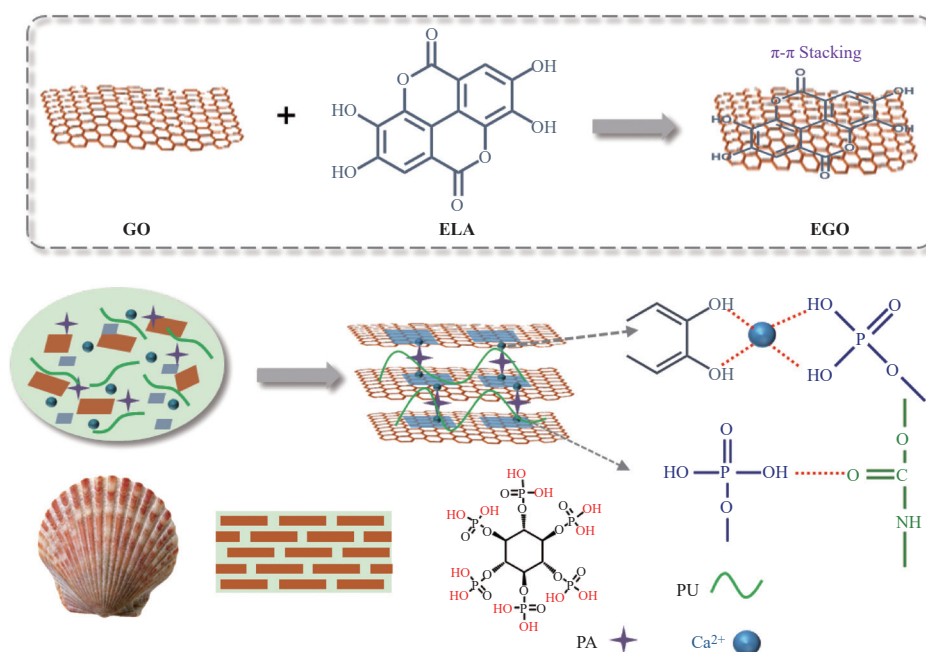
Owing to the compatibility between polycaprolactone (PCL) and polybutyrolactam (PBL), the crystallinity of PCL/PBL electrospun fiber membrane increases with the increasing of PBL content, which significantly improves the hydrophilicity and mechanical properties of the membranes, while the thermal stability of the membrane decreases due to easy thermal decomposition of PBL.



Preparation of High Toughness Polymer Composites with Self-Healing Capacity via Non-Covalent Bonding

ZHANG Yu, ZHANG Lexing, WANG Yang, DONG Weifu

Journal of Functional Polymers, 2023, 36 (2) : 170–177.

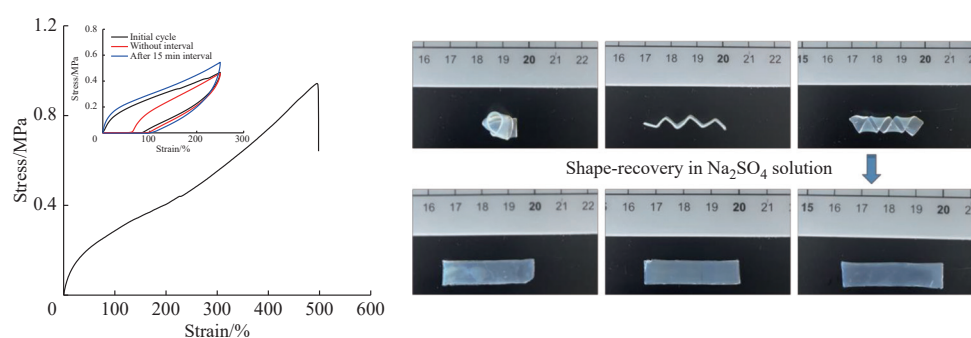


The non-covalent bonds endow nacre-like materials with excellent toughness by dissipating energy through interlaminar slip and a certain water-induced self-healing capacity attributing to the existing ionic and hydrogen bonds.

Shape Memory Hydrogel Based on Gelatin and Its Derivatives/Hydroxyethyl Methacrylate/Sodium Sulfate

HE Miaomiao, CHEN Lingdong, ZHANG Li, ZHEN Hui, XU Pinghua, BAO Jiaohui

Journal of Functional Polymers, 2023, 36 (2) : 178–184.



Double network structure and Hofmeister effect improve the strength of the hydrogel. Natural polymer components endow the hydrogel with degradability and excellent biocompatibility. In addition, the hydrogel has salt-responsive shape memory property.