

## Special Issue: The Youth Innovation Promotion Association of the Chinese Academy of Sciences

We are pleased to announce the special issue of the Youth Innovation Promotion Association (YIPA) of the Chinese Academy of Sciences (CAS). Established in 2011, YIPA aims to enhance interaction, encourage interdisciplinary collaboration among members, and promote the career development of young researchers, under the age of 35. To date, YIPA has more than 5000 regular members and more than 600 advanced members, including many researchers actively working in the polymer field.

To highlight the polymer research of YIPA members, we organized this special issue. After peer review, we are pleased to publish 12 invited contributions, including 2 reviews and 10 research articles. The contributions cover a variety of topics, including polymer synthesis, degradation mechanism, polymer theory and simulation, renewable polymers, and functional polymers for biomedical, optical, electronic, or other applications of interest.

Sustainable development of polymers requires recyclability, degradability, and renewability. Choosing poly(butylene adipate-co-terephthalate) (PBAT), one of the synthetic biodegradable polyesters produced on a large scale, Liu *et al.* investigated the specific ionic effects on the enzymatic degradation of PBAT films, shedding light on the development of new biodegradable plastics with controlled degradability. Cellulose is one of the most abundant natural polymers. Zhang *et al.* summarized the recent advances in fabricating functional cellulose derivatives and regenerated biomass materials using ionic liquids as a green medium.

The physical properties of polymers are strongly influenced by topology. Ring polymers have no chain ends and exhibit unique properties. Lu *et al.* studied the size and dynamics of ring polymers under different topological constraints using dynamic Monte Carlo simulations to better understand the mechanisms producing the unique dynamic behavior of ring polymers. Block copolymers can generate nanostructures by self-assembly. Feng *et al.* studied the crystallization-driven self-assembly of oligo(*p*-phenylene vinylene) containing block copolymers and found that the structure of the alkyl side chains of the crystalline core segments plays an important role in the morphology of the self-assembled micelles.

Polymer materials are often used in a multi-phase and multi-component manner to obtain balanced or functional properties. He and Liang reviewed the use of Janus nanofillers as interfacial compatibilizers for polymer blends and discussed how the Janus nanofillers influence the phase morphologies, mechanical properties, and functionalities of the blends. Liu *et al.* prepared Prussian blue engineered cellulose acetate nanofiltration membrane using a thin film composite strategy. The defect-free FeCo-Prussian blue selective layer exhibits high separation performance for dye molecules and excellent photocatalytic degradation of organic foulants.

Polymers have already been widely used in the biomedical

field. In this special issue, Chen *et al.* designed a kind of near-infrared light- and acidity-activated micellar nanoparticles for mitochondrial-targeted doxorubicin (DOX) delivery to combat DOX resistance in small-cell lung cancer. Tian *et al.* synthesized multifunctional nanoparticles for photoacoustic imaging guided combined chemo/photothermal antitumor therapy. Wang *et al.* fabricated a type of hyperbranched polyacetal quaternary ammonium by a succession of efficient click strategies, which exhibit enhanced antibacterial activity.

For optoelectronic and optical applications, Zhang *et al.* designed and synthesized a simple building block (POBT) to prepare non-fused ring electron acceptors for organic photovoltaic devices (OPV). The power conversion efficiency of the best OPV devices reaches 11.15%. Wang *et al.* constructed a novel type of supramolecular polymer based on propeller-shaped triphenylamine cyanostilbenes. The resulting polymers exhibited severe emission quenching upon the addition of 2,6-dinitrotoluene, ascribed to photo-induced electron transfer from triphenylamine cyanostilbenes to the explosive analyte. Lu *et al.* fabricated double-layer mechanofluorochromic hydrogels to achieve force-triggered response of overlapping color, holding potential for applications such as smart display and information encryption.

Young researchers, as the most creative and productive group, represent the future of a research field. At the present situation, there is limited opportunity for early career researchers, especially those with no overseas experience, to receive long-term support to have the freedom to explore science frontiers. YIPA provides an excellent example of long-term support for young researchers to encourage exploratory research (4–7 years). We hope this special issue will stimulate new ideas to promote exploratory research and support the development of young researchers in the polymer field.

Finally, we would like to thank all the authors and reviewers for their valuable contributions and the editors for their meticulous editorial work on this special issue.



Prof. Guo-Ming Liu  
Guest Editor



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