ACS POLYMERS Au
AN OPEN ACCESS JOURNAL OF THE AMERICAN CHEMICAL SOCIETY

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Editorial

ACS Polymers Au's First Issue

Cite This: *ACS Polym. Au* 2021, 1, 1−3

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We are delighted to be writing this editorial to introduce the first issue of *ACS Polymers Au*. As the readers know, *ACS Polymers Au* is one of nine fully open access gold (Au) journals that ACS launched this year to serve researchers around the world who are either mandated by their grants or prefer/choose to publish in fully open access journals. *ACS Polymers Au* is for researchers in the polymers and soft matter community and serves as the fully open access complement to other ACS hybrid journals (i.e., subscription + open access) that focus on the topic of polymer science and engineering, namely *Macromolecules*, *Biomacromolecules*, *ACS Macro Letters*, and *ACS Applied Polymer Materials*.

To introduce this journal to the community, we published an inaugural editorial,[1] in which we described the journal's scope, review criteria, manuscript formats, and our vision for this journal as its inaugural editors. We also announced the members of our editorial advisory board who are outstanding researchers in the polymer science community from around the world. These members represent the diverse voices and views of fellow polymer researchers in different countries, at different stages of their careers, and working on different subfields within polymer science. Understanding their diverse views on open access will also guide us and future editors of *ACS Polymers Au*. For readers who are interested in understanding the motivation for having such fully open access gold journals, we direct them to the editorial from Shelley Minteer,[2] the editor-in-chief of all nine ACS Au journals.

This first issue of *ACS Polymers Au* comprises peer-reviewed publications in letter and article formats and highlights the journal's scope and the expected originality and impact of the studies we will continue to publish in *ACS Polymers Au* in forthcoming issues. The publications in this first issue cover topics ranging from novel polymer synthesis schemes, new measurement techniques for probing polymer thin films, polymer modeling and simulation enabled discovery of new physics, and advances in assembly of polymer/peptide materials geared for biocompatible drug/protein delivery. The authors of these publications come from institutions in three different continents with expertise in diverse topics of relevance to the polymer and soft matter community.

The first publication is a letter from Kametani and Ouchi (Figure 1) who describe a one-pot copolymerization−alcoholysis process for synthesis of sequence-controlled alternating copolymers of methacrylate and styrene.[3] They demonstrate further that such sequence-controlled alternating copolymers exhibit lower glass transition temperatures than their analogous (in composition) copolymers with statistical sequences. Kametani and Ouchi's contributed cover art is featured as one of the supplementary covers of this issue.

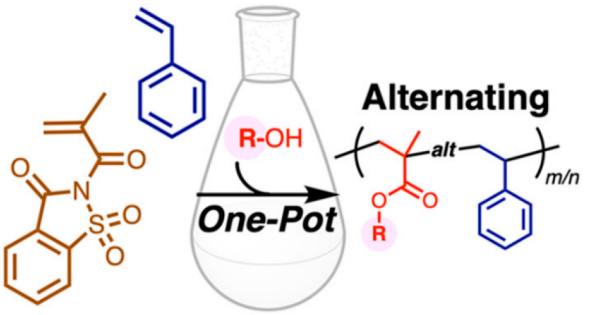
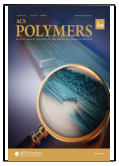


Figure 1. Table of contents image from Yuki Kametani and Makoto Ouchi, "One-Pot Preparation of Methacrylate/Styrene Alternating Copolymers via Radical Copolymerization and Alcoholysis Modification: Sequence Impacts on Glass Transition Temperature" (DOI: 10.1021/acspolymersau.1c00012).

In the following article, Zhang et al. present a new technique for visualizing evolution of wrinkling patterns and crack propagation during the deformation of ultrathin films and for measuring their fracture energies (Figure 2).[4] Using this new technique and complementary simulations, they describe how the thin film fracture behavior depends on film thickness and molecular weight of the polymer. They go beyond the model polystyrene films and demonstrate broad applicability of this technique for other polymeric systems (e.g., semicrystalline semiconducting polymers). Zhang et al.'s artistic rendering of this probing technique is highlighted as the front cover image for this first issue. We note that Xiaodan Gu, one of the corresponding authors of this publication, has been recognized as one of *ACS Polymers Au*'s "2021 Rising Stars in Polymers"; the virtual special issue with a collection of such peer-reviewed publications from all "2021 Rising Stars in Polymers" is scheduled to be released in early 2022.

In the next article, Fujita et al. describe a biocompatible macromolecular protein delivery platform which they call "polyion complex vesicle" (or "PICsome").[5] These PICsomes are composed entirely out of cationic and anionic oligomeric peptide components, making them noncytotoxic and easily programmable in sequence and function. They describe the preparation and characterization of these PICsomes and

Published: August 11, 2021



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ACS Polym. Au 2021, 1, 1−3

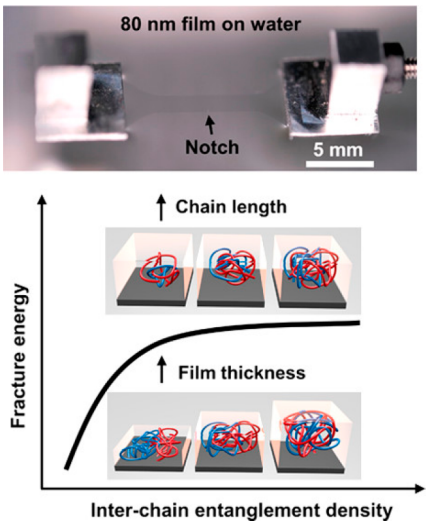

Figure 2. Table of contents image from Song Zhang, Masato Koizumi, Zhiqiang Cao, Keyou S. Mao, Zhiyuan Qian, Luke A. Galuska, Lihua Jin, and Xiaodan Gu, "Directly Probing the Fracture Behavior of Ultrathin Polymeric Films" (DOI: 10.1021/acspolymersau.1c00005).

demonstrate their application for protein delivery. Through conjugation with a cell-penetrating peptide, they successfully encapsulate a functional enzyme in the PICsome and deliver the functional enzyme into plants where they maintain stability and function for extended periods of time (Figure 3). Fujita et al.'s work is highlighted in the second supplementary cover art for this issue.

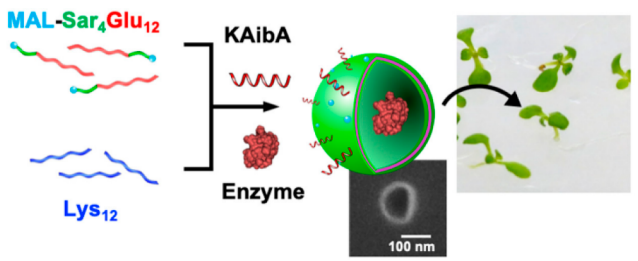

Figure 3. Table of contents image from Seiya Fujita, Kousuke Tsuchiya, and Keiji Numata, "All-Peptide-Based Polyion Complex Vesicles: Facile Preparation and Encapsulation of the Protein in Active Form" (DOI: 10.1021/acspolymersau.1c00008).

The following article by Adhikari et al. describes a molecular simulation study with a coarse-grained model of a polymer brush to describe nonintuitive molecular packing and resulting heterogeneous gas dynamics which explain prior experimental studies that show spherical nanoparticles grafted with polymer brushes exhibiting enhanced gas transport compared to a melt of neat polymers.[6] Their simulations show that polymer brushes can serve as a heterogeneous transport medium where gas molecules can have fast dynamics near (and parallel) to the grafting surface and slower dynamics in the central region of the brush, both relative to the corresponding polymer melt (Figure 4). On a nontechnical note, these authors have the honor of being the first accepted peer-reviewed article in *ACS Polymers Au*. Further, much like the geographical diversity of the contributions in this issue, this paper also reflects the truly global nature of innovation in polymer science; this work is from

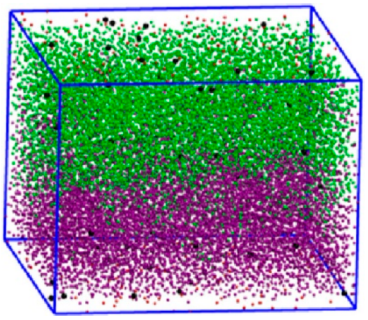

Figure 4. Table of contents image from Sabin Adhikari, Arash Nikoubashman, Ludwik Leibler, Michael Rubinstein, Jiarul Midya, and Sanat K. Kumar, "Gas Transport in Interacting Planar Brushes" (DOI: 10.1021/acspolymersau.1c00006).

researchers working in four different institutions in three different countries (USA, France, and Germany).

In the next article, Miclotte et al. describe RAFT-mediated emulsion polymerization induced polymer core−shell particles that exhibit a lower-critical solution temperature (LCST) phase transition in aqueous media.[7] They also showcase the use of a postpolymerization betainization approach for modifying the chemistry of the core-forming block and tuning the resulting thermoresponsive nature of these particles, in particular, the cloud-point temperature and flocculation temperature of these particles (Figure 5). The approach and results in this article could serve to guide design of thermoreponsive drug delivery vehicles.

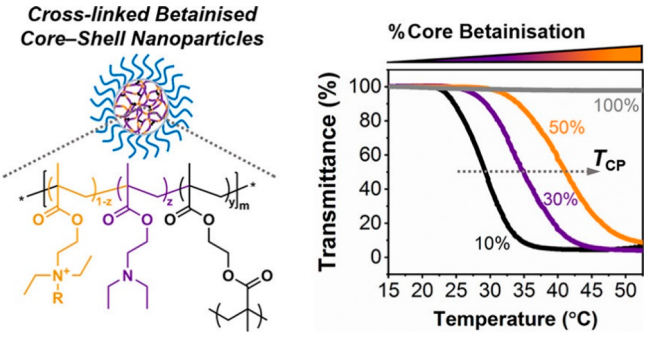

Figure 5. Table of contents image from Matthieu P. J. Miclotte, Stefan B. Lawrenson, Spyridon Varlas, Bilal Rashid, Emma Chapman, and Rachel K. O'Reilly, "Tuning the Cloud-Point and Flocculation Temperature of Poly(2-(diethylamino)ethyl methacrylate)-Based Nanoparticles via a Postpolymerization Betainization Approach" (DOI: 10.1021/acspolymersau.1c00010).

Rasch and Göstl, in the last article of this issue, describe a new synthesis scheme that can lead to multiresponsive polymer hydrogels with complex optical and mechanical responses (Figure 6).[8] With hydrogels formed from pyrene-substituted macro-cross-linkers, they find the hydrogels' excimer formation pathways as a function of intrachain pyrene molar proportion and overall pyrene mass concentration. They also show that the extent of hydrogel swelling controlled by the water content, in turn, serves as a gating stimulus for photoinduced solvolysis of the esters from their polymer backbone. The corresponding author of this publication, Robert Göstl, is also an early career researcher recognized as one of *ACS Polymers Au*'s "2021 Rising Stars in Polymers".

https://doi.org/10.1021/acspolymersau.1c00022
ACS Polym. Au 2021, 1, 1−3

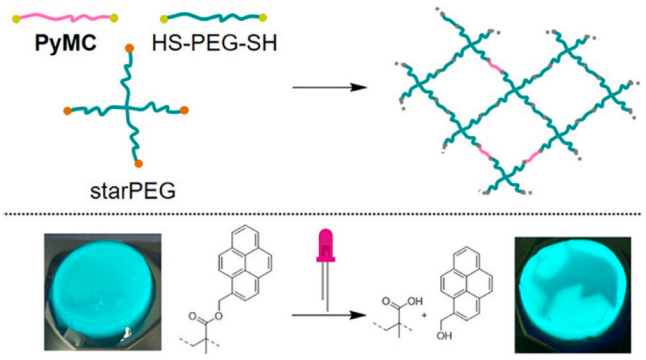

Figure 6. Table of contents image from Dustin Rasch and Robert Göstl, "Gated Photoreactivity of Pyrene Copolymers in Multiresponsive Cross-Linked starPEG-Hydrogels" (DOI: 10.1021/acspolymersau.1c00011).

This issue's publications are in one of two formats—letter or article. The editorial team of *ACS Polymers Au* also intends to publish peer-reviewed reviews and perspectives, and in the upcoming issues, the readers can look out for reviews and perspectives on a diverse range of timely, current topics of interest to polymer researchers around the world. Readers who are interested in submitting a review/perspective on a topic are strongly encouraged to reach out to the editors with a proposal topic prior to submission or preparation to receive feedback on suitability and fit of the proposed topic in the context of the journal's scope and current interest in the polymer science and engineering research community.

We end this editorial with gratitude to the reviewers whose time and sincere efforts help us maintain the rigor in the review process and publish impactful papers. Our reviewers' diligence and fairness in the reviews is greatly appreciated by the editorial team (us) as well as the authors. We encourage early career researchers who wish to serve as reviewers to look out for future editorials from us where we will share our thoughts on how one could serve as a reviewer along with some tips and guidance on how to write informative and constructive reviews. We will also focus our future editorials on important issues related to evolving publishing trends, *ACS Polymers Au* editorial advisory board's recommendations, best practices for authors to consider when writing cover letters, suggesting reviewers, preparing table of contents images/cover art, etc.

We hope you enjoy reading the papers in this first issue!

Arthi Jayaraman, Deputy Editor orcid.org/0000-0002-5295-4581

Harm-Anton Klok, Associate Editor orcid.org/0000-0003-3365-6543

AUTHOR INFORMATION

Complete contact information is available at:
https://pubs.acs.org/10.1021/acspolymersau.1c00022

Notes

Views expressed in this editorial are those of the authors and not necessarily the views of the ACS.

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(5) Fujita, S.; Tsuchiya, K.; Numata, K. All-Peptide-Based Polyion Complex Vesicles: Facile Preparation and Encapsulation of the Protein in Active Form. *ACS Polymers Au* **2021**, DOI: 10.1021/acspolymersau.1c00008.

(6) Adhikari, S.; Nikoubashman, A.; Leibler, L.; Rubinstein, M.; Midya, J.; Kumar, S. K. Gas Transport in Interacting Planar Brushes. *ACS Polymers Au* **2021**, DOI: 10.1021/acspolymersau.1c00006.

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(8) Rasch, D.; Göstl, R. Gated Photoreactivity of Pyrene Copolymers in Multiresponsive Cross-Linked starPEG-Hydrogels. *ACS Polymers Au* **2021**, DOI: 10.1021/acspolymersau.1c00011.