



PJ ZEON Award for outstanding papers in *Polymer Journal* 2019

Keiji Tanaka, Editor-in-Chief¹

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The three winners of the 2019 PJ ZEON Award have been announced by the Society of Polymer Science Japan (SPSJ) as follows:

Hironori Izawa (Tottori University, Japan) for the contribution “*Polysaccharide-based Wrinkled Surfaces Induced by Polyion Complex Skin Layers upon Drying*”, Vol. 51, No. 7, 2019.

Takuya Katashima (The University of Tokyo, Japan) for the contribution “*Mechanical Properties of Doubly Cross-linked Gels*”, Vol. 51, No. 9, 2019.

Yasuhito Suzuki (Osaka Prefecture University, Japan) for the contribution “*Phase Separation during Bulk Polymerization of Methyl Methacrylate*”, Vol. 51, No. 4, 2019.

Drs. Izawa, Katashima and Suzuki received their award certificates and medals at an award ceremony held in conjunction with the SPSJ annual meeting in May 2020 in Fukuoka. Each winner also received a cash prize of 300,000 JP yen and gave an invited talk based on their respective papers.

On behalf of the editors and editorial board members of *Polymer Journal*, I wish to congratulate Drs. Izawa, Katashima and Suzuki on this honor in recognition of their excellent papers [1–3]. I hope the award will provide encouragement to these young researchers for their bright future careers. Academic profiles of the winners can be found below this announcement.

The PJ ZEON Award started since 2005 as the successor of The PJ Paper Award, which started since 1992.

This PJ ZEON Award is open to all of the first author of papers published in *Polymer Journal* [4] who is under 38 years of age. We are looking forward to receiving your submissions papers and many applications for the 2020 PJ ZEON Award. Each year the SPSJ selects up to three most outstanding papers published by young

authors in *Polymer Journal*, as recommended by the selection committee and board of directors of the SPSJ. Those who are interested should go to the SPSJ website (<https://main.spsj.or.jp/c5/pj/pj.htm>) for further information. Finally, we express our sincere appreciation to Zeon Corporation for their generous sponsorship of this award.

About the winners



Hironori Izawa

Hironori Izawa received his Ph.D. in 2010 from Kagoshima University under Prof. Jun-ichi Kadokawa. He spent postdoctoral research periods at the National Institute for Materials Science (NIMS) under the supervision of Prof. Katsuhiko Ariga (2010–2012). In 2012, he moved to Tottori University as an assistant professor. In 2020, he promoted to an associate professor. His major interests are the preparation of functional polymeric materials, including gel and film materials, with enzymatic or chemical processes.

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About the award article: The authors reported polyion complex (PIC) skin layers are effective tool for inducing surface wrinkling upon drying. The PIC skin layers were produced on the surface of chitosan (CS) films through immersion in sodium alginate (AG) solutions. After washing excess adsorbed AG, microscopic wrinkles appeared upon drying. In addition, the authors found that there is only a two-fold difference in the elastic moduli between the PIC skin layer and the CS substrate. Furthermore, wrinkled films could be made water resistant by thermal crosslinking of the PIC skin layer. The thermally crosslinked wrinkled surfaces demonstrated the low cell adhesiveness.



Takuya Katashima

Takuya Katashima received Ph.D. degree in 2015 from The University of Tokyo under the supervision of Prof. Ung-il Chung and Prof. Takamasa Sakai. He was an assistant professor of Osaka University in the group of Prof. Tadashi Inoue (2015–2018), and a postdoctoral fellow in the group of Dr. Keiji Numata at RIKEN (2018–2019). In 2019, he moved to The University of Tokyo as a postdoctoral fellow under Prof. Takamasa Sakai. He investigates the rheological properties of polymer networks.

About the award article: The authors fabricated the doubly crosslinked gel, with internal stress by stretching the gel during the gelation reaction using tetra-PEG gels, which is formed by the AB type crosslink-coupling of two mutually reactive tetra-arm polyethylene glycol. In a doubly crosslinked gel, two networks having different reference states coexist with and balance each other, resulting in mechanical anisotropies. These properties were investigated by tuning the time for the imposition of the stretching of the gels and the stretching ratio, and successfully explained by the balance between the elastic energies of the first and second networks.



Yasuhito Suzuki

Yasuhito Suzuki received Ph.D. degree in 2015 from Johannes Gutenberg-Universität Mainz in Germany under the supervision of Prof. Hans-Jürgen Butt and Prof. George Floudas. He was a postdoctoral researcher (2016–2018) in the Group of Prof. Aaron Stebner at Colorado School of Mines. In 2018, he moved to Osaka Prefecture University as a tenure-track assistant professor in the group of Prof. Akikazu Matsumoto. His research interests cover polymer dynamics, glass transition, crystallization, and kinetics of radical polymerization.

About the award article: The authors reported polymerization induced phase separation during bulk polymerization of methyl methacrylate (MMA). Bulk free radical polymerization is a polymerization process of pure monomer without an addition of any solvent. Because relatively high molecular weight and pure polymer can be easily obtained, this method is applied to adhesives and coatings. However, a sudden temperature increase occurs at some point of polymerization and this limits the application of bulk polymerization to a larger volume because the temperature may exceed the boiling point of monomer. While this so-called Trommsdorff effect has been attributed to the viscosity increase and hence reduced termination rate, the detailed mechanism is still elusive. The authors used a redox reaction of benzoyl peroxide by an amine at room temperature as an initiator and investigated the bulk polymerization of MMA in detail. It was found that phase separation into MMA rich and PMMA rich phase occurs during bulk polymerization. Moreover, the phase separation occurs at the same timing as the temperature increase at the onset of Trommsdorff effect. After the phase separation, the molecular weight of PMMA formed is one order of magnitude higher than that is formed before the phase separation event. Our findings suggest that the polymerization induced phase separation is intimately related to Trommsdorff effect.

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