

## EDITORIAL

# PJ ZEON Award for outstanding papers in *Polymer Journal* 2012

*Polymer Journal* (2013) 45, 577–578; doi:10.1038/pj.2013.43

The winners of the 2012 PJ ZEON Award have been announced by the Society of Polymer Science Japan (SPSJ). Each year the SPSJ selects the three most outstanding papers published by young authors in *Polymer Journal*, as recommended by the selection committee and board of directors of the SPSJ. For 2012, the winners are as follows:

Dr Masahiko Miyauchi<sup>1</sup> (Kaneka Corporation, Japan) for the contribution 'Novel phenylethynyl-terminated PMDA-type polyimides based on KAPTON backbone structures derived from 2-phenyl-4,4'-diaminodiphenyl ether', Vol. 44, No. 9, 2012.

Dr Makoto Ouchi<sup>2</sup> (Kyoto University, Japan) for the contribution 'Aqueous metal-catalyzed living radical polymerization: highly active water-assisted catalysis', Vol. 44, No. 1, 2012.

Dr Takashi Ubukata<sup>3</sup> (Yokohama National University, Japan) for the contribution 'Facile one-step photopatterning of polystyrene films', Vol. 44, No. 9, 2012.

Academic profiles of the winners can be found below this announcement.

Dr Miyauchi, Dr Ouchi and Dr Ubukata received their award certificates and medals at an award ceremony held in conjunction with the SPSJ annual meeting in May 2013 in Kyoto. Each winner also received a cash prize of 300 000 yen and presented a talk based on their respective papers.

On behalf of the editors and editorial board of *Polymer Journal*, I wish to congratulate Dr Miyauchi, Dr Ouchi and Dr Ubukata on this well-deserved honor in recognition of their excellent papers. I hope the award will provide encouragement to these young researchers and will be one of many awards they will receive throughout their bright careers.

The award is open to all first authors of papers published in *Polymer Journal*, who are under the age of 38 years at the time of submitting their paper. I hope this award will encourage submissions from eligible authors to *Polymer Journal*, and look forward to seeing many applications for the 2013 PJ ZEON Award. Those interested should go to the SPSJ website (<http://www.spsj.or.jp>) for further information. Finally, let me extend our sincere appreciation to Zeon Corporation for their generous sponsorship of this award.

Takashi Kato  
Editor-in-Chief

## ABOUT THE WINNERS



Masahiko Miyauchi

Dr Masahiko Miyauchi is currently Assistant Manager at Kaneka Corporation. He also works in collaboration with the Japan Aerospace Exploration Agency (JAXA) on aerospace materials (2007 to date). At present, he is a visiting scientist at the National Aeronautical and Space Administration (NASA/LaRC) (2012 to date). He received his PhD in polymer science from Osaka University (2005). His current research is focused on the development of polyimide films, resin and fiber reinforced plastics with high heat resistance for aerospace applications.

*About the award article:* The authors developed novel phenylethynyl terminated, addition-type imide oligomers derived from pyromellitic dianhydride and 2-phenyl-4,4'-diaminodiphenyl ether. These imide oligomers were found to show outstanding processability (high solubility and an extremely low melt viscosity) for the fabrication of carbon fiber reinforced plastics. These imide oligomers are thermally cross-linked to give a high glass transition temperature ( $T_g > 350$  °C) and good mechanical properties. A carbon fiber prepreg was prepared from imide oligomers in solution and subsequently used to fabricate high-quality composite laminates for potential use at high temperatures in a variety of aerospace applications.

**Makoto Ouchi**

Dr Makoto Ouchi received his BS (1996), MS (1998) and PhD (2001) degrees in polymer chemistry from Kyoto University. In 2001, he joined the Toyota Central R&D Laboratories Inc., where he participated in the development of poly(lactic acid) automobile materials. In 2004, he moved to Kyoto University to become Assistant Professor at the Department of Polymer Chemistry, Graduate School of Engineering, and was promoted to Associate Professor in 2010. From 2007 to 2008, he was a visiting associate at the California Institute of Technology, working with Professor David A Tirrell. His current research interests include metal-catalyzed precision polymerizations, functional polymer synthesis and sequence control in chain-growth polymers through the molecular design of monomers, initiators, catalysts and reaction fields.

*About the award article:* The recipient and his co-authors achieved a truly catalytic aqueous living radical polymerization of alkyl and functionalized methacrylates with transition metal catalysts. Crucial in this work was the design of hydrophilic ligands, with a focus on the role of water in the catalysis, that endow functionality-sensitive organometallic complexes with robustness, high solubility and, in turn, high catalytic activity in water. In particular, a pentamethylcyclopentadienyl ruthenium complex with phenolic phosphine ligands showed excellent activity and was soluble enough to mediate remarkably fast aqueous living radical polymerizations of hydrophilic monomers, their block copolymerizations and high-molecular-weight polymers ( $DP_n \sim 1000$ ) with narrow chain-length distributions. These active aqueous systems could open the door to environmentally benign precision polymerizations and bio-applications.

**Takashi Ubukata**

Dr Takashi Ubukata received his PhD from the Tokyo Institute of Technology in 2001 under the supervision of Professor Takahiro Seki. He worked at the RIKEN as a special postdoctoral researcher with Professor Masahiko Hara from 2001 to 2004. He then became Research Associate at Yokohama National University, working with Professor Yasushi Yokoyama, and he was promoted to Assistant Professor in 2008 and Associate Professor in 2012. His research interests include the development of photofunctional organic materials.

*About the award article:* The authors reported reversible surface relief grating (SRG) formation using general purpose polystyrene films through repeated cycles of spatially patterned ultraviolet (UV) light irradiation and heating. When a film is irradiated with spatially patterned UV light that can excite the electronic state of polystyrenes, SRGs are produced as a result of lateral material transfer from shaded to irradiated areas. The efficiency of SRG formation heavily depends on the temperature of the film. SRG growth is synchronized with polystyrene photoreaction, including photooxidation and dimerization. Thus, the authors proposed that SRGs are formed because of the difference between the diffusibilities of the irradiated photoreacted polystyrene and the shaded original polystyrene. This SRG formation method can be applied to polystyrenes of various molecular weights and generalized to different polymer systems.

- 1 Miyachi, M., Ishida, Y., Ogasawara, T. & Yokota, R. Novel phenylethynyl-terminated PMDA-type polyimides based on KAPTON backbone structures derived from 2-phenyl-4,4'-diaminodiphenyl ether. *Polym. J.* **44**, 959–965 (2012).
- 2 Ouchi, M., Yoda, H., Terashima, T. & Sawamoto, M. Aqueous metal-catalyzed living radical polymerization: highly active water-assisted catalysis. *Polym. J.* **44**, 51–58 (2012).
- 3 Ubukata, T., Moriya, Y. & Yokoyama, Y. Facile one-step photopatterning of polystyrene films. *Polym. J.* **44**, 966–972 (2012).