Candidate application to the ISGS Board of Directors

Prof. Masahide Takahashi

Age: 45

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CV with main research interests

Prof. Masahide Takahashi is a professor of Graduate School of Materials Science and a director of International Laboratory of Materials Science and Nanotechnology (iLMNT) in Osaka Prefecture University (OPU). He obtained Ph.D at Kobe University in 1996. Then he spent several years as a post-doctoral fellow in Toyota Technological Institute and Kobe University. He was appointed as a research associate in Kyoto University in 1999, and promoted to an associate professor in 2006; he moved to OPU as a full professor in 2009.
He has been working on sol-gel preparation of functional materials in photonics and electronics. With his studies on fundamental chemistry of the sol-gel processing, new organically modified oxo copolymers were prepared by a controlled condensation in solvent-free reactions for variety of advanced applications, such as rewritable holographic memory, whispering gallery mode lasers and proton conductors. Recently, his group is working on responsive and adaptive micro structured/porous thin films of organic-inorganic hybrid materials for micro fluidics or other advanced applications. Based on these research, He has published >150 scientific papers and >80 international/national patents, and gave invited talks in >40 conferences. He was an organizer of several international/domestic conferences (15); editorial board member of 5 scientific journals. He is a recipient of national and international awards (the Award for Excellent Young Scientists (Japanese Society of Applied Physics), Distinguished Young Scientists Award (the Ceramics Society of Japan), Japan-Australia Joint Ceramics Award, BCSJ award).
Prof. Takahashi is a promoter of worldwide sol-gel research. His collaborative research network involves different countries such as Italy, Australia, France, Korea, China, and U.S.A. His collaboration with the Italian research group is the most successful within his international collaborations; this collaboration started in 2007 when he was nominated as an invited professor in Prof. Innocenzi's group (Univ. Sassari, Italy). Since then, he has co-authored with Italian collaborators more than 30 papers in prestigious international journals. In 2012, he established "International Laboratory of Materials Science and Nanotechnology (iLMNT)" in OPU as a director, which is a virtual international laboratory for collaborative research in the sol-gel area. Members of "iLMNT" are from Italy, Great Britain, Australia; iLMNT promotes the human resource exchanges and it focuses mainly on young promising researchers working in the sol-gel area. In 2012, 6 graduated students of OPU have been trained in different iLMNT laboratories thanks to the exchange program for young researchers. Prof. Takahashi is also an organizer of Korea-Japan Sol-Gel Workshop held every 2~3 years for intellectual exchange and construction of friendly and collaborative environment. According to his international contributions, he has been awarded as a visiting professor at DAP, University of Sassari (Italy) and Kumming University of Science and Technology (China).

5 recent publications

[1] Tokudome Y., Tarutani N., Nakanishi K., Takahashi M.," Layered Double Hydroxide (LDH)-based Monolith with Interconnected Hierarchical Channels: Enhanced Sorption Affinity for Anionic Species", *J. Mater. Chem.* A, **1**, 7702-7708 (2013).

[2] Tokudome Y., Suzuki K., Kitanaga T., Takahashi M., "Hierarchical Nested Wrinkles on Silica-Polymer Hybrid Films: Stimuli-Responsive Micro Periodic Surface Architectures", *Sci. Rep.*, 2, 683; DOI:10.1038/srep00683 (2012).

[3] Takahashi M., Figus C., Malfatti L., Tokuda Y., Yamamoto K., Yoko T., Kitanaga T., Tokudome Y., Innocenzi P., "Strain driven self-rolling of hybrid organic-inorganic microrolls: interfaces with self-assembled particles", *NPG Asia Materials*, 4, e22 (2012). DOI: 10.1038/am.2012.40.

[4] Takahashi M., Inoue M., Ihara R., Yoko T., Nemoto T., Isoda S., Malfatti L., Costacurta S., Innocenzi P.,

"Photo-fabrication of titania hybrid films with tunable hierarchical structures and stimuli responsive properties", *Adv. Mater.*, **22**, 3303-3306 (2010).

[5] Kakiuchida H., Takahashi M., Tokuda Y., Yoko T., "Rewritable holographic structures formed in organic-inorganic hybrid materials by photothermal processing", *Adv. Func. Mater.*, **19**(16), 2569-2576 (2009).

Statement of interest

I would like to exert myself for promoting sol-gel science and technology internationally, especially for Asian and Oceanian countries for education of young researchers/engineers and linking the sol-gel society with industry.
Sol-gel processing is a cheap, versatile and controllable preparation method for functional materials in a variety of forms such as particles, thin films, monoliths. These features make "sol-gel" as one of the most environmental-friendly approach. Liquid processing of it shows good combination with nano chemistry/technology. In general, special/expensive equipment are not required. The only requirement is the fundamental understanding of the chemical processes. So that, researchers and engineers in whole world can take advantage of "sol-gel" as a tool for the practical realization of their idea. This has been done for a last few decades and will be continued for centuries. Toward the sustainable society, the advertisement of sol-gel science and technology should be the central mission of the international sol-gel society (ISGS), which includes fosterage of worldwide community for advanced research, construction of relationship with academia and industry, and education of young researchers/engineers in both advanced and developing countries. The International Sol-Gel Conference in China (2011) and Japan (2015) are the best opportunities for sol-gel researchers in Asian and Oceanian countries. As a board member candidate from Japan (host of Sol-Gel 2015) I think I would be of much help for the success of the workshop and subsequent collaboration within different countries.
As shown in my CV above, I am keen to expand international relationships of my research group. Now it is a time to exert my knowledge and experience for ISGS as a board member.