Deuterium Switch in Material Design

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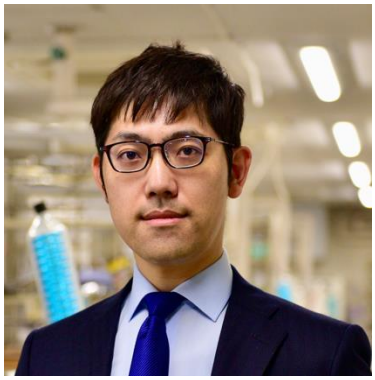
This lecture will focus on our recent contributions to the deuterium switch in material design. In the first half of the lecture, I will present several new synthetic methods for deuterated materials based on catalysis. This work is primarily aimed at enabling the practical synthesis of deuterated bioactive compounds for metabolic studies.[1] The second half of the lecture will deal with the function of precisely deuterated molecular catalysts. The impact of catalyst deuteration on the reactivity of chiral phase-transfer organocatalysts will be discussed.[2]

[1] Itoga, M.; Yamanishi, M.; Udagawa, T.; Kobayashi, A.; Maekawa, K.; Takemoto Y.; Naka, H. *Chem. Sci.* **2022**, *13*, 8744.

[2] Murayama, S.; Li, Z.; Liang, H.; Liu, Y.; Naka, H.; Maruoka, K. *Chem. Eur. J.* **2023**, 29, e202301866.

Biography:



Hiroshi Naka is currently an Associate Professor at Kyoto University. He obtained his B.S. (2003) and M.S. (2005) from the University of Tokyo. He received his Ph.D. (2008) from Nagoya University. His Ph.D. thesis focused on developing chemoselective aluminate bases under the supervision of Prof. Masanobu Uchiyama. Hiroshi was a Research Associate in Prof. Yoshinori Kondo's laboratory at Tohoku University (2006−2008). From 2008−2020 he was an Assistant Professor at Nagoya University, where he developed transition metal catalysis for selective hydration and heterogeneous photocatalysis for alcohol transformations in collaboration with Prof. Ryoji Noyori and Prof. Susumu Saito. Since 2020, he has been at the Graduate School of Pharmaceutical Science, Kyoto University. From 2023 he also serves as the director of the Deuterium Science Research Unit at Center for the Promotion of Interdisciplinary Education and Research, Kyoto University. His research group studies sustainable catalysis and material design, with an emphasis on the development of deuteration reactions and their applications in organic chemistry.