GTR ORGANIC SEMINAR

The Versatile Chemistry of N-Heterocycle-stabilized Iodanes – From Synthesis to Halogen Bond Catalysis

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4:30 pm ~ 6:00 pm
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The Venture Hall, 3F, VBL

GTR
Nagoya University

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The Versatile Chemistry of *N*-Heterocycle-stabilized Iodanes – From Synthesis to Halogen Bond Catalysis

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The covalent attachment of donor-substituents is an essential feature in iodane chemistry. Intramolecular donor-iodine interactions stabilize the hypervalent iodine atom by forming (pseudo)cyclic structures that have increased stability and solubility compared to their unsubstituted derivatives. Most of the well-established donor-substituted iodanes are based on tethered oxygen ligands, particularly carboxylic acids, amides and ethers, to form benziodoxol(on)es.[1] Despite their great success as versatile ligands in transition metal chemistry, *N*-heterocycles have been treated novercal.

We systematically investigate the chemistry of *N*-heterocycle-stabilized iodanes (NHIs) and will share our latest results regarding their synthesis, stability and structural aspects.[2] Based on these findings, the great potential of *N*-heterocycle-substituted iodoarenes (NHAIs) in enantioselective oxidation catalysis and NHI-based cyclic iodonium salts in XB-catalysis will be discussed intensively.[3,4] Finally, the first experimental structure elucidation of an *in situ* generated chiral iodane based on vibrational circular dichroism (VCD) and DFT will be presented.[5]

References

[1] (a) Y. Li, D. P. Hari, M. V. Vita, J. Waser, *Angew. Chem. Int. Ed*. **2016**, *55*, 4436.; (b) A. Yoshimura, M. S. Yusubov, V. V. Zhdankin, *Org. Biomol. Chem.* **2016**, 14, 4771.
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[3] (a) A. H. Abazid, B. J. Nachtsheim, *Angew. Chem. Int. Ed.* **2020**, 59, 1479; (b) A. H. Abazid, N. Clamor, B. J. Nachtsheim, *ACS Catal.* **2020**, *10*, 8042. (c) A. H. Abazid, B. J. Nachtsheim, *Chem. Commun.* **2021**, *57*, 8822.
[4] (a) A. Boelke, T. Kuczmera, E. Lork, B. J. Nachtsheim, *Chem. Eur. J.* **2021,** *27***,** 13128 (b) A. Boelke, T. J. Kuczmera, L. D. Caspers, E. Lork, B. J. Nachtsheim, *Org. Lett.* **2020**, *22*, 7261.
[5] T. P. Golub, A. H. Abazid, B. J. Nachtsheim, C. Merten, *Angew. Chem.* ***2022,*** DOI: https://doi.org/10.1002/anie.202204624.