



## A Powerful Way to Make Fluorinated Organic Compounds- Hypervalent Iodine Reagents Can Prof. Dr. Chi Zhang

State Key Laboratory of Elemento-Organic Chemistry, College of  
Chemistry, Nankai University, Tianjin 300071, China

13:00 – 14:30, Thu., 12<sup>th</sup> September, 2024

EI創発工学館2F Fujiホール（北部生協に隣接する新館）

Fluorinated organic compounds are widely used in pharmaceutical chemistry, agrochemistry, and materials science. In order to introduce fluorine atoms or fluorinated functional groups into the organic molecules, many different types of organo-reagents have been developed to date. Among them, hypervalent iodine reagents have established themselves in the field of fluoroorganic chemistry as reagents of diverse reactivity and utility in many distinct transformations. As a research group of hypervalent iodine chemistry, we have been designing, synthesizing new hypervalent iodine reagents and working to uncover their new reactivity. Three new hypervalent iodine reagents developed by our group are introduced here, including the first hypervalent trifluoromethylthio-iodine(III) reagent, **TFTI**,<sup>1</sup> a hypervalent fluoriodine(III) reagent, **AFBI**,<sup>2</sup> and a new hypervalent trifluoromethyl-iodine(III) reagent, **TFNI**<sup>3</sup> (Figure 1). The efficacy of these three reagents to transfer a fluorine atom or a fluorinated group (SCF<sub>3</sub> or CF<sub>3</sub>) is also disclosed. By the way, a widely used Lewis acid BF<sub>3</sub>·Et<sub>2</sub>O has been shown to be an effective fluorine source in either an intramolecular aminofluorination reaction or a ring contraction monofluorination reaction mediated by the hypervalent iodine(III) reagent ArIO.<sup>4</sup>

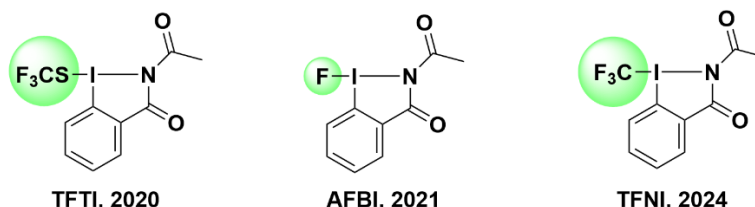


Figure 1. Three new hypervalent iodine(III) reagents having a fluorine atom or a fluorinated functional group

### References

1. (a) X.-G. Yang, K. Zheng, C. Zhang\* *Org. Lett.* **2020**, 22, 2026. (b) X.-G. Yang, J.-J. Li, F.-H. Du, Y.-X. Cheng, C. Zhang\* *Org. Lett.* **2023**, 25, 2964. (c) Y.-X. Cheng, X.-G. Yang, F.-H. Du, C. Zhang\* *Green Chem.*, **2024**, 26, 5914.
2. J. Ren, F.-H. Du, M.-C. Jia, Z.-N. Hu, Z. Chen, C. Zhang\* *Angew. Chem. Int. Ed.* **2021**, 60, 24171.
3. M. Huang, C. Zhang\* *Org. Lett.* **2024**, 26, 4158.
4. (a) J. Cui, Q. Jia, R.-Z. Feng, S.-S. Liu, T. He, C. Zhang\* *Org. Lett.* **2014**, 16, 1442. (b) Y.-C. Han, Y.-D. Zhang, Q. Jia, J. Cui, C. Zhang\* *Org. Lett.* **2017**, 19, 5300.

Host: Kazuaki Ishihara, [ishihara@cc.nagoya-u.ac.jp](mailto:ishihara@cc.nagoya-u.ac.jp)