**Alkyl SuFEx Click Hubs via Water-Accelerated Synergistic Organocatalysis**

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Along with the significant demand for sustainable homogeneous catalysis, the importance of efficient

synthesis and simple purification of complex organic compounds is attracting attention.1 In this presentation, a series of water-accelerated chemical transformations will be discussed. Firstly, unprecedented *N*-heterocyclic carbene (NHC)-catalyzed aza-Michael addition reaction is shown to access β-aminosulfonyl fluorides, which are key hubs of the sulfur(VI) fluoride exchange (SuFEx) reaction.2 In addition, new methods based on high-turnover catalytic Michael and thia-Michael addition reactions via significant hydrophobic amplification are displayed.3–5 Finally, the synergistic action of a hydrophobic Brønsted acid in combination with a hydrogen-bonding donor activator enabled the formation of the three-component Petasis-type allylation reaction.6 The developed exceptionally mild but potent catalytic systems facilitated a broad substrate scope, and enabled efficient multi-gram scalabilities. As a crucial reaction medium in all cases, water considerably augmented the reaction rate with excellent chemo- and site-selectivity (up to >99:1) compared to conventional organic solvents.



**References**

1. M. Israr, H. Y. Bae\* *Green Chem.* **2023**, *25*, 2387.

2. J. H. Park, S. B. Lee, B. J. Koo, H. Y. Bae\* *ChemSusChem* **2022**, 15, e202201000.

3. S. B. Lee, J. H. Park, H. Y. Bae\**ChemSusChem* **2022**, *15*, e202200634.

4. J. H. Park, S. G. Song, M. H. Shin, C. Song,\* H. Y. Bae\**ACS Sens.* **2022**, *7*, 423–429.

5. J. H. Park, G. A. González-Montiel, P. H. Y. Cheong,\* H. Y. Bae\* *Org. Lett.* **2023**, *25*, 1056.

6. Goswami, P.; Cho, S. Y.; Park, J. H.; Kim, W. H.; Kim, H. J.; Shin, M. H.; Bae,\* H. Y. *Nat. Commun.* **2022**, *13*, 2702.