



Biomolecules, Synthesis and Methods team (BSM)

UMR 7042 CNRS, Université de Haute-Alsace, Université de Strasbourg
IRJBD, 3bis rue Werner, 68100 Mulhouse

Keywords : Pentafluorosulfanyl (SF_5) chemistry, homogeneous catalysis, heterocyclic chemistry, asymmetric synthesis, Diels-Alder cycloaddition, fluorine and sulfur chemistry, and mechanistic investigations.

Principal Investigators :



Dr. Vincent Bizet
(team leader)



Dr. Nicolas Blanchard

LIMA | LABORATOIRE D'INNOVATION
MOLÉCULAIRE ET APPLICATIONS

UNIVERSITÉ
HAUTE-ALSACE

Contact: vbizet@unistra.fr

Website: <https://bsm.unistra.fr/>



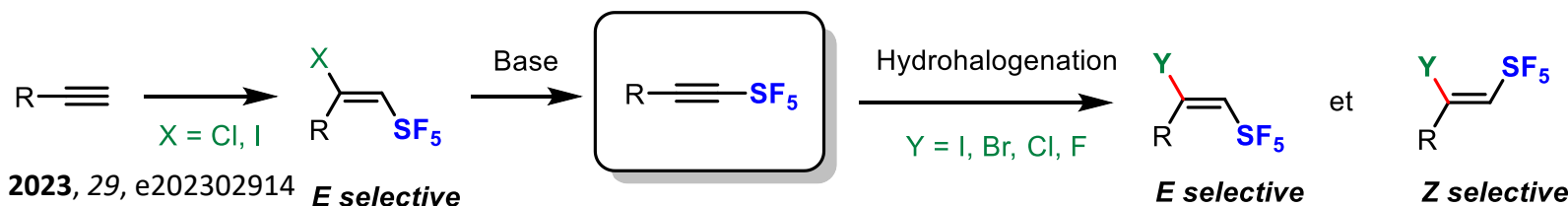
From SF₅-alkynes to various SF₅ scaffolds

➡ **1st Axis:** Easy preparation of SF₅ alkynes and their use as SF₅ building blocks



ACS Org. Inorg. Au, **2021**, 1, 43

Angew. Chem. Int. Ed. **2023**, 62, e202300685



Chem. Eur. J. **2023**, 29, e202302914

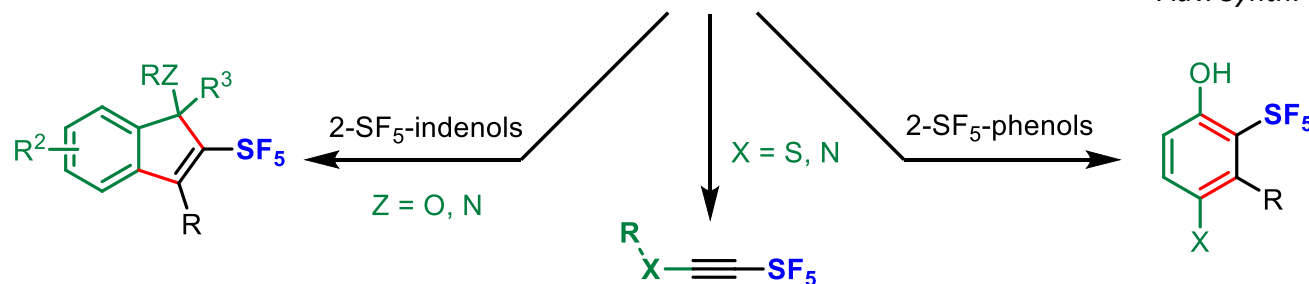
Org. Lett., **2024**, 26, 365

E selective

E selective

Z selective

Adv. Synth. Catal., **2024**, 366, 3481



Angew. Chem. Int. Ed., **2024**, 63, e202315909

Org. Lett., **2024**, 26, 10369

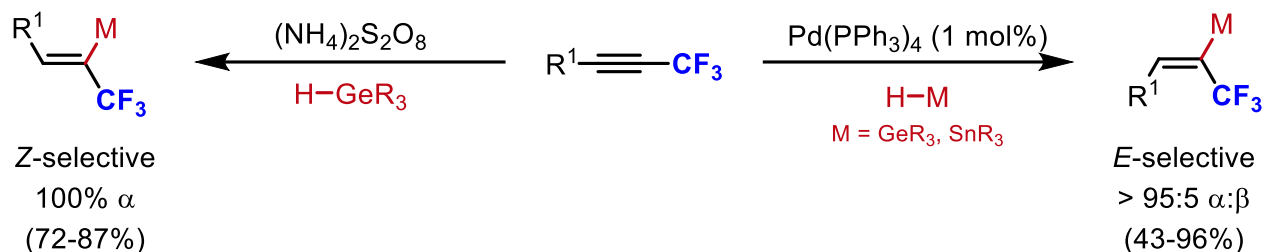
ACS Org. Inorg. Au, **2025**, 5, 275

For reviews on SF₅-alkynes, see: a) *Tetrahedron* **2022**, 117-118, 132814; b) *C. R. Chim.* **2024**, 27, 227; c) *Synthesis* **2025**, 57, 1117

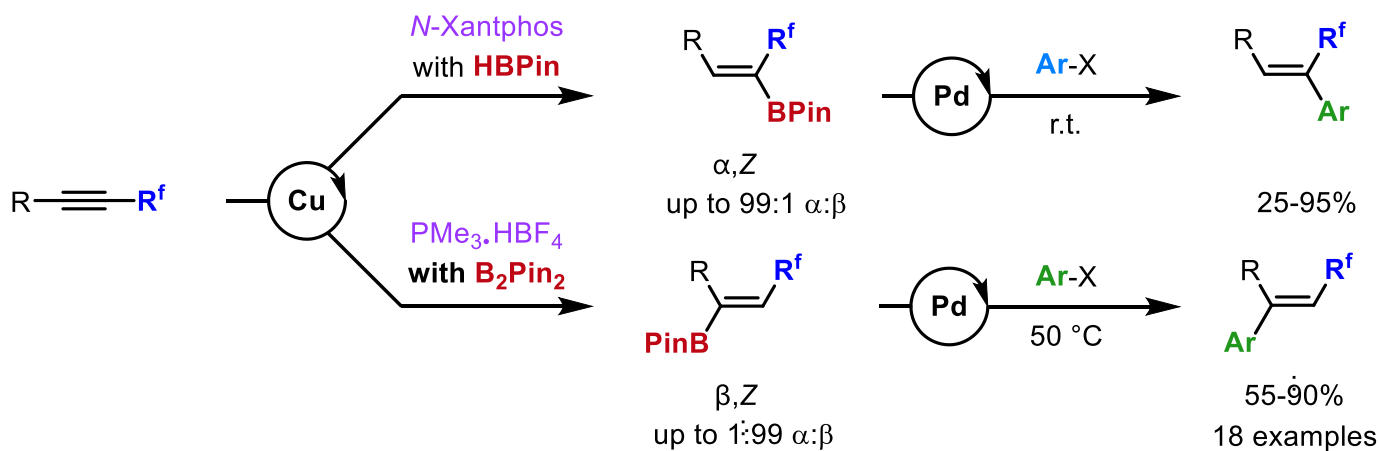
For a review on physicochemical properties of the SF₅, see: *Chem. Soc. Rev.* **2026**, DOI:10.1039/D5CS00566C

Transition metal catalysis

➡ **2nd Axis:** Regio-, chemo- and stereoselective metallation of polarized alkynes



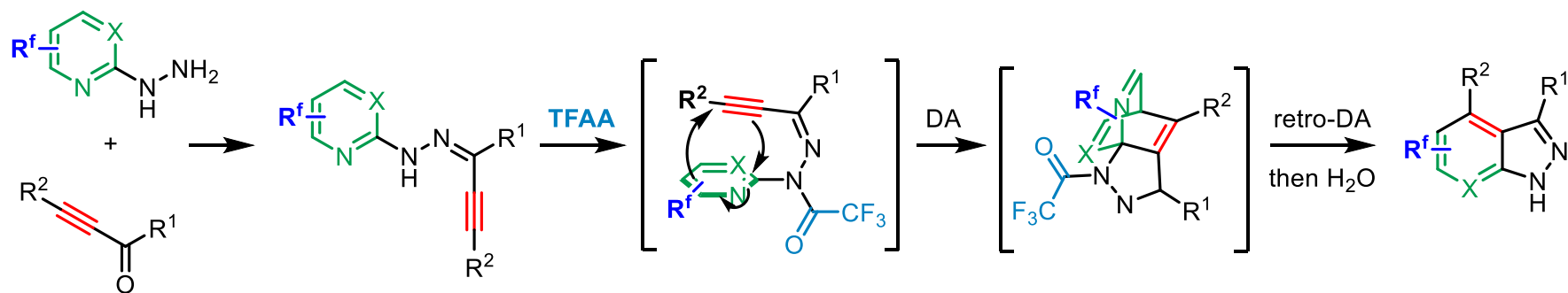
Org. Lett. **2015**, 17, 1794; *Synthesis* **2016**, 48, 3317



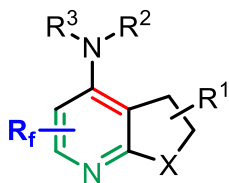
J. Am. Chem. Soc. **2020**, 142, 11153; *Synlett* **2024**, 35, 1107

Heterocycles synthesis

➡ **3rd Axis:** Inverse electron demand hetero-Diels-Alder (DA) cycloaddition

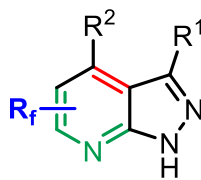


Selected examples



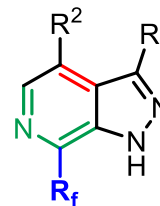
$R_f = F$ or CF_3 and $X = O, S, NR$

Org. Lett. **2016**, 18, 1610
J. Org. Chem. **2017**, 82, 1726



$R_f = F$ or CF_3

J. Am. Chem. Soc. **2019**, 141, 15901
Org. Proc. Res. Dev. **2020**, 24, 776



$R_f = F$ or CF_3

Org. Lett. **2023**, 25, 7847

The SynthIA High-Throughput Experimentation platform

➡ An HTE facility funded by the ANR « MatLight 4.0 » project, led by the Université de Haute-Alsace

- At the interface of molecular chemistry, material science and artificial intelligence
- Discovery acceleration
- For academic and industrial collaborations



BSM Team and main fundings

➡ BSM Team 2025 (at Mulhouse Christmas market)



➡ Fundings

