

University of Louisville
Department of Chemistry

Renee Pace

Literature Seminar

When: October 9, 2023

Time: 3:00 p.m.

Location: CBL-16

“The C-F functionalization of ArCF₃”

Abstract:

Selectively functionalizing the inactive C(sp³)-F bonds in pursuit of the interesting aryl difluoromethylated compounds for medical and agricultural purposes is a challenging task. The most common precursor, used for its availability and low cost, are trifluoromethylarenes (ArCF₃). A reoccurring problem is preventing the over defluorination due to the subsequent lowering of bond energies as the process ensues (i.e. going from aryl-CF₃ inadvertently to aryl-CR₃). We will explore current researchers' approach to this unique problem and the best methods to prevent the over-defluorination. This includes, base promoted reductive coupling, cleavage with metal complexes, and Lewis-pair-mediated selective fluoride substitution.

References:

1. Frustrated Lewis-Pair-Mediated Selective Single Fluoride Substitution in Trifluoromethyl Groups
Dipendu Mandal, Richa Gupta, Amit K. Jaiswal, and Rowan D. Young
Journal of the American Chemical Society 2020 142 (5), 2572-2578
DOI: 10.1021/jacs.9b12167
2. A Base-Promoted Reductive Coupling Platform for the Divergent Defluorofunctionalization of Trifluoromethylarenes
Shawn E. Wright and Jeffrey S. Bandar
Journal of the American Chemical Society 2022 144 (29), 13032-13038
DOI: 10.1021/jacs.2c05044
3. Cleavage of C(sp³)-F Bonds in Trifluoromethylarenes Using a Bis(NHC)nickel(0) Complex
Hiroaki Iwamoto, Hiroto Imiya, Masato Ohashi, and Sensuke Ogoshi
Journal of the American Chemical Society 2020 142 (45), 19360-19367
DOI: 10.1021/jacs.0c09639