SEPTEMBER 23-27 2024
19BMOS
BRAZILIAN MEETING ON ORGANIC SYNTHESIS
BENTO GONÇALVES, RS - BRAZIL

Strain-Release Pentafluorosulfanylation

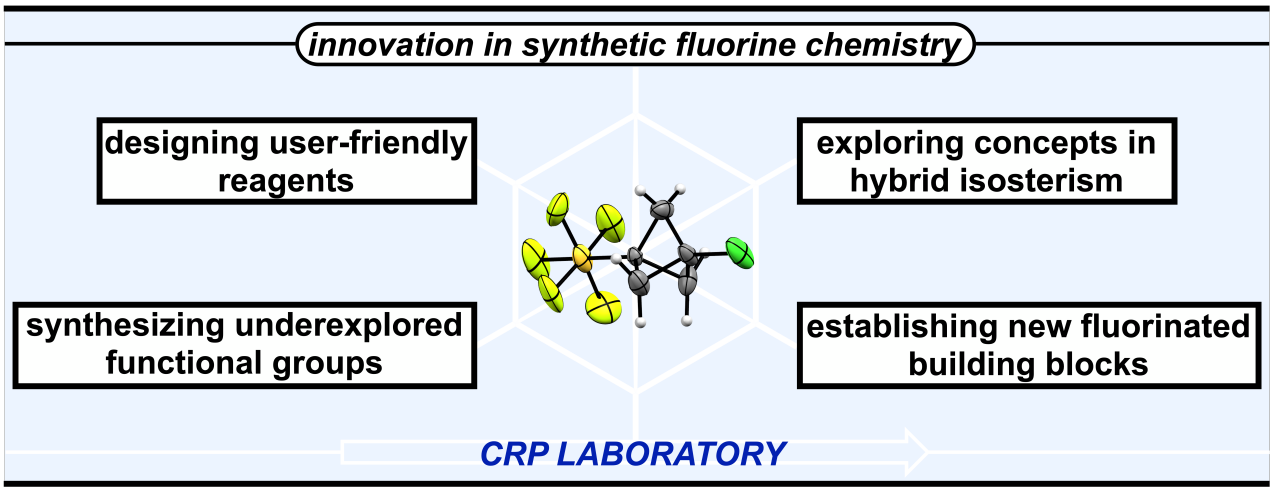
Prof. Cody Ross Pitts*
Department of Chemistry, University of California, Davis, 1 Shields Avenue, Davis, CA 95616, U.S.A.

e-mail: crpitts@ucdavis.edu

Keywords: *fluorinated functional groups, strain-release functionalization, radical chemistry.*

ABSTRACT

This presentation details recent progress in our laboratory toward the synthesis and evaluation of underrepresented fluorinated functional groups that have been made more accessible using the TCICA/KF approach to oxidative fluorination.[1] A major theme will be our recent merging of SF_5 radical chemistry with strain-release functionalization of [1.1.1]propellane[2] and [1.1.0]bicyclobutanes.[3] Structural consequences of making these SF_5-based "hybrid isosteres" and preliminary mechanistic insight will be discussed. Aside from being a topic of fundamental interest, we believe this work affords an unusual and subtle type of flexibility in molecular design that could prove useful in increasing availability of building blocks containing $C(sp^3)$–SF_5 bonds to medicinal chemists, agrochemists, and in the materials community.



ACKNOWLEDGEMENTS

C.R.P. thanks the NIH/NIGMS (R35GM150861) and the University of California, Davis for financial support.

REFERENCES

(1) Kraemer, Y.; Bergman, E. N.; Togni, A.; **Pitts, C. R.** Oxidative Fluorination of Heteroatoms Enabled by Trichloroisocyanuric Acid and Potassium Fluoride. *Angew. Chem. Int. Ed.* **2022**, *61*, e202205088.

(2) Kraemer, Y.; Ghiazza, C.; Ragan, A. N.; Ni, S.; Lutz, S.; Neumann, E. K.; Fettinger, J. C.; Nöthling, N.; Goddard, R.; Cornella, J.; **Pitts, C. R.** Strain-release Pentafluorosulfanylation and Tetrafluoro(aryl)sulfanylation of [1.1.1]Propellane: Reactivity and Structural Insight. *Angew. Chem. Int. Ed.* **2022**, *61*, e202211892.

(3) Kraemer, Y.; Buldt, J. A.; Kong, W.-Y.; Stephens, A. M.; Ragan, A. N.; Park, S.; Haidar, Z. C.; Patel, A. H.; Shey, R.; Dagan, R.; McLoughlin, C. P.; Fettinger, J. C.; Tantillo, D. J.; **Pitts, C. R.** Overcoming a Radical Polarity Mismatch in Strain-Release Pentafluorosulfanylation of [1.1.0]Bicyclobutanes: An Entryway to Sulfone- and Carbonyl-Containing SF_5–Cyclobutanes. *Angew. Chem. Int. Ed.* **2024**, e202319930.