



Department of Chemistry Seminar Series Spring 2023

Friday, January 13, 2023, 3:30 PM – HPA1-O119 (Health Sciences)
Host: Fernando Uribe-Romo

Synthetic Strategies toward Fluorosulfurylation of Organic Molecules and Sulfur-Fluoride Exchange (SuFEx)



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Sulfur-fluoride exchange (SuFEx) chemistry is emerging as a promising synthetic tool in chemical biology, material science, and synthetic chemistry. In synthesis, sulfur (VI) fluorides show unique promise as synthons in organic chemistry due their stability versus other sulfur (VI) halogen analogues. Key to the adoption of SuFEx chemistry is the development of efficient modes to synthesize and react sulfur (VI) fluorides. Research initiatives employing group 2, and transition-metal chemistry toward the synthesis of sulfonyl fluorides will be described. New SuFEx methods that react a broad set of S(VI) fluorides with carbon, oxygen, and nitrogen-based nucleophiles towards structurally diverse S(VI) compounds will also be presented.

A focus will be on a new SuFEx reaction to synthesize nitrogen-based sulfonylated compounds from a variety of S(VI) fluorides mediated via a Lewis acidic calcium salt will be described. Under a unified set of reaction conditions, sulfonyl fluorides, fluorosulfates, and sulfamoyl fluorides can be coupled with a variety of amines to synthesis a wide array of aryl and alkyl sulfonamides, sulfamides, and sulfamates in good to excellent yield. Computational and NMR kinetic studies that aim to elucidate the mechanism of Ca-activation will be discussed. Lessons learned from the mechanistic studies have led to preliminary data suggesting Ca-catalysis is possible.