From sulfonium salts to samarium catalysis: new radical chemistry for synthesis

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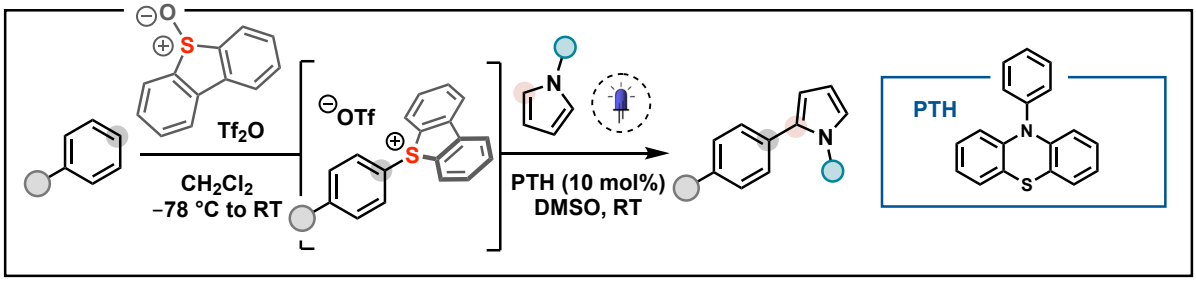
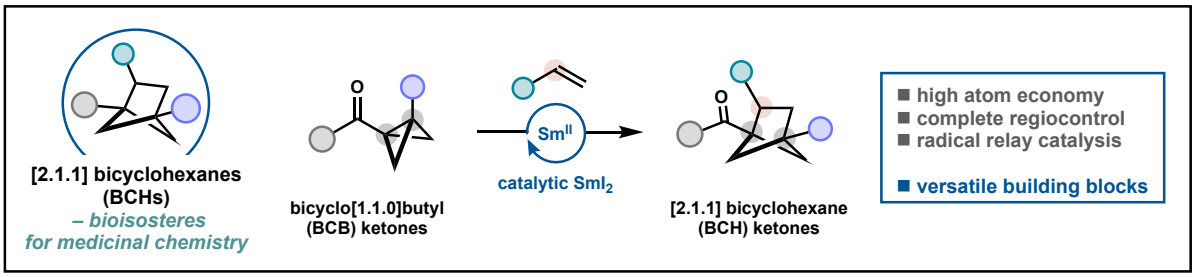
Part I – Our approach to transition metal-free cross-coupling uses sulfur to replace metals in activating substrates and generating reactive intermediates for exploitation in C–C bond-formation. In particular, we will describe the exploitation of *in situ* generated aryl sulfonium salts in photocatalytic[1] and photochemical[2] coupling processes involving aryl radicals.



Part II – Samarium(II) iodide is one of the most widely-used single electron transfer reductants in chemistry. We will describe our recent studies on catalysis with SmI_2[3] and the application of Sm(III)-ketyl radicals in a catalytic approach to bioisostere synthesis.[4]



[1] Aukland, M. H.; Šiaučiulis, M.; West, A.; Perry, G. J. P.; Procter, D. J. *Nat. Catal.* **2020**, *3*, 163.
[2] Dewanji, A.; van Dalsen, L.; Rossi-Ashton, J. A.; Gasson, E.; Crisenza, G. E. M.; Procter, D. J. *Nat. Chem.* **2023**, *15*, 43.
[3] Agasti, S.; Beattie, N. A.; McDouall, J. J. W.; Procter, D. J. *J. Am. Chem. Soc.* **2021**, *143*, 3655.
[4] Agasti, S.; Beltran, F.; Pye, E.; Kaltsoyannis, N.; Crisenza, G. E. M.; Procter, D. J. *Nat. Chem.* **2023**, *15*, 535.