# Radical cascade sulfonylation/cyclization of benzimidazole derivatives with sulfinates induced by visible light

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Organosulfur moieties are essential features in numerous natural products[1] and functional materials.[2] They hold particular significance in the pharmaceutical industry,[3] with over 150 sulfur-containing drugs currently available on the market.[4]

As a result, the development of milder and more environmentally friendly methodologies for C-S bond formation has been the object of intensive work for organic chemists. Photocatalysis has emerged as a powerful approach, enabling unique reactivity pathways that are challenging to achieve through conventional thermal transformations.

In recent years, our research group has focused on the photoinduced generation of key sulfur-centered radicals, such as sulfonyl and thiyl radicals,[5] aiming to leverage them for the functionalization of unsaturated compounds. In this context, benzimidazole derivatives with appended alkyne functionality and sodium sulfinates have been employed as the starting materials in a radical cascade sulfonylation/cyclization mediated by bench-stable diarylmethylium tetrafluoroborate organo-photocatalysts under visible light irradiation.

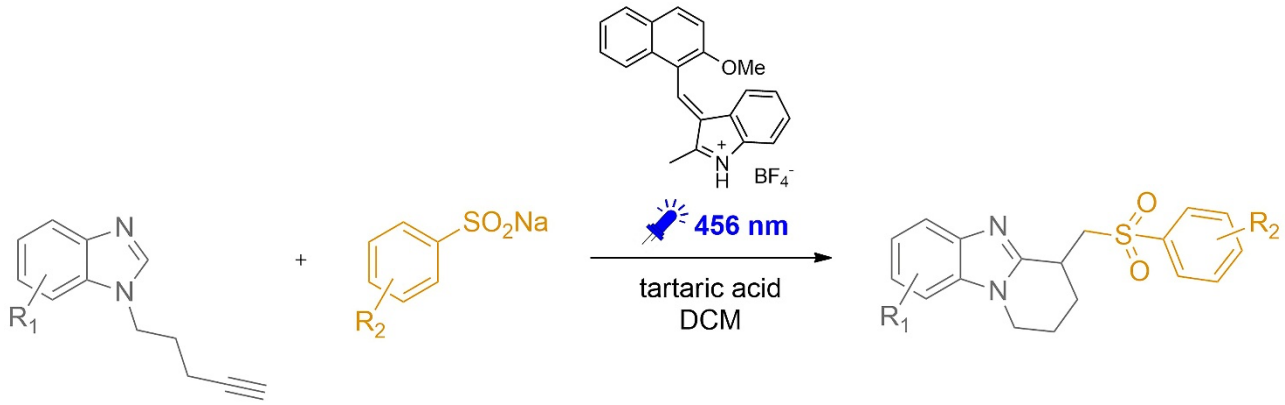


**Figure 1.** Visible light sulfonylation-cyclization of benzimidazoles with sulfinates.

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[3] M. Feng, B. Tang, S.H. Liang, X. Jiang, *Curr. Top. Med. Chem.*, **2016**, *16*, 1200-1216.
[4] K. A. Scott, J. T. Njardarson, *Top. Curr. Chem.*, **2018**, *376*, 5-34.
[5] a) P. Renzi, E. Azzi, S. Ascensio, S. Parisotto, F. Sordello, F. Pellegrino, G. Ghigo, A. Deagostino, *Chem. Sci*., **2023**, *14*, 2721-2734; b) P. Renzi, M. Rusconi, G. Ghigo, A. Deagostino, *Adv. Synth. Catal*., **2023**, *24,* 4623-4633**.**