

Visible-Light-Induced Difunctionalisations of Alkynes with Arylsulfinates

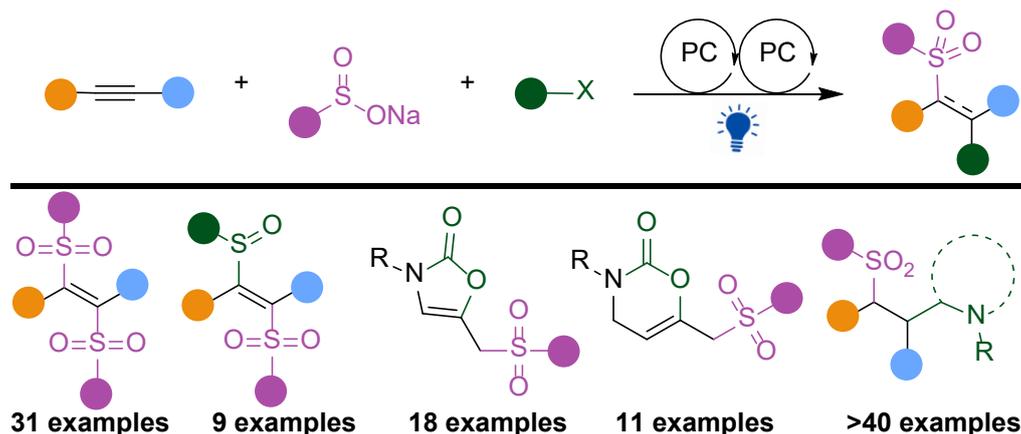
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Organosulfones are an important class of organosulfur molecules and versatile synthons in organic chemistry.¹ Due to their importance in various fields, many synthetic strategies have been developed to synthesise sulfone-containing molecules.² Among them, radical sulfonylation is one of the most efficient approaches to access functionalized sulfones with high step- and atom-economy.³ Recently, visible light-promoted reactions have played a promising role in organic synthesis because of demonstrated complex bond constructions under mild reaction conditions and visible light is environmentally benign.⁴ In this context, we report on the radical difunctionalisation of alkynes under ambient conditions to access highly functionalised sulfones. We will present photochemical conditions and mechanistic investigations for (1) iodine-mediated tuneable disulfonylation of alkynes, (2) sustainable carboxylative sulfonylation of (homo)propargylic amines with CO₂, and (3) efficient metal-free three-component carbosulfonylation of alkynes with arylsulfinates.⁵ We have also applied our carbosulfonylation method to the synthesis of sedum alkaloids.



Scheme 1. Difunctionalisation of alkynes with arylsulfinates.

If time permits, we will describe an S-selective method for arylation of pyridylsulfides and show how the resulting pyridylsulfonium salts can be used for the synthesis of a range of bipyridines.⁶

References

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