Radical Reaction of Sulfonyl Chloride in Access to Vinyl Sulfones

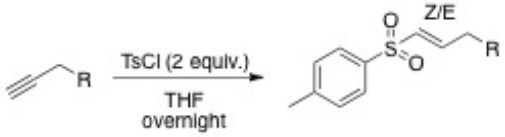
I. Kovalova[1], C. S. Gloor[1], F. Denes[2], P. Renaud[1]*

[1]University of Bern, [2]University of Nantes

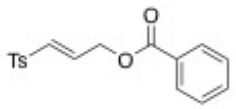
Vinyl sulfones are extensively used as a building blocks for total synthesis of natural products[1]. They can be prepared by olefination reactions[2], elimination from *α*- or *β*-substituted sulfones[3], oxidation of vinyl sulfides[4] or others.

Their preparation from terminal alkynes is highly attractive. However, such transformations have only been reported *via* hydrometallation process[5].

Herein we describe selective introduction of vinyl sulfones. We generate the sulfonyl radical from *p*-toluenesulfonyl chloride and add it onto alkyne.

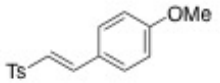


Method A: reflux, DLP (0.5 equiv)
Method B: light irradiation (45-48°C)

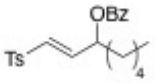


Method A: 83%, Z:E = 2.4:1
Method B: 90%, Z:E = 1.5:1

Method A: 97%, Z:E = 1.2:1
Method B: 80%, Z:E = 2.2:1



Method A: 35%, Z:E = 1:1.0
Method B :23%, Z:E = 1:1.1



Method A: 90%, Z:E = 2.6:1
Method B: 80%, Z:E = 2.9:1

[1] Riccardo Piccardi, Philippe Renaud, P. *Eur. J. Org. Chem.* **2007**, 4752-4757
[2] Vijay Nair, Anu Augustine, T. D. Suja, *Synthesi*s **2002**, 2259-2265
[3] Hao Qian, Xian Huang, *Synlett* **2001**, 1913-1916
[4] Xian Huang, De-Hui Duan, Weixin Zheng, *J. Org. Chem.* **2003**, 68, 1958-1963
[5] De-Hui Duan, Xian Huang, *Synlett,* **1999**, 3, 317–318