[S1-3] [4/18/2002(Thur) 16:00-16:30/Hall A]

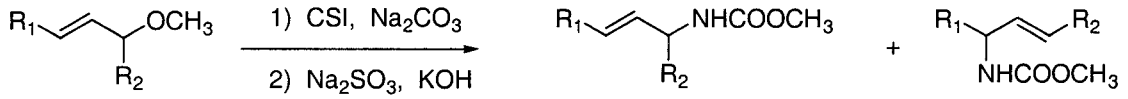
Novel Synthetic Method for Allyl Carbamates Using CSI and its Application

Ji Duck Kim, Min Hee Lee, In Soo Kim, Young Hoon Jung*

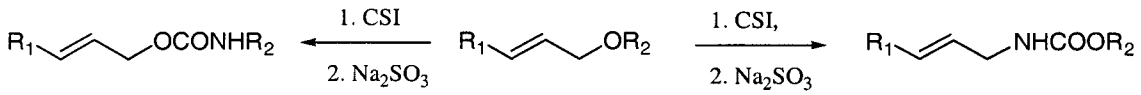
College of Pharmacy, Sungkyunkwan University, Suwon 440-746, Korea

Chlorosulfonylisocyanate(CSI)hastwoelectrophilicsitesforattackbynucleophilicreagents,namely, the carbonyl carbon and sulfur of the sulfonyl chloride group. To date, chlorosulfonyl isocyanate (CSI) has been used in the [2+2] cycloaddition reactions of various substituted alkenes, especially enol ethers, to synthesize the β-lactam moiety of carbapenem antibiotics and β-amino acids. Recently, chiral enol ethers have been used as the precursors of chiral β-lactam compounds and chiral β-amino acids.

As part of a program aimed at producing various amino acids which can be used as a versatile building blocks, benzyl allyl ether was reacted with CSI to obtain a β-lactam with a benzyloxy methyl moiety, which can be readily converted to the acid moiety. However, rather than obtaining the β-lactam, we unexpectedly obtained the corresponding carbamate. Specifically, instead of obtaining the expected β-lactam products arising from formal [2+2] annulation, the corresponding N-allylcarbamates were obtained as sole products.

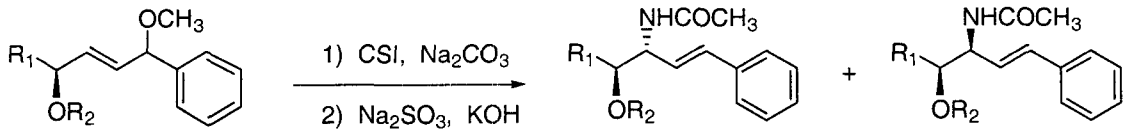


Our studies are based on the observation that various N-allylcarbamates and allyl carbamates are formed from various allyl ethers using chlorosulfonyl isocyanate (CSI) in accord with the alkyl moiety of allyl alkyl ethers and alkyl(aryl) alkyl ethers. From these results, we developed novel technique to determine the stability of carbocations in solution phase and set up the stability order of various carbocations.



A mild and efficient debenzylation of various benzyl and *p*-methoxybenzyl ethers was accomplished using our CSI reaction system.

Stereoselectivity of CSI reaction with chiral allyl ethers was investigated to afford chiral β-hydroxy-α-amino acid precusors.



Our CSI reaction system was applied to the total synthesis of cytoxazone, which was isolated from Streptomyces species and has shown cytokine modulating activity.

References

1. Kim, J. D.; Lee, M. H.; Lee, M. J.; Jung, Y. H. *Tetrahedron Lett.* **2000**, 41, 5073-5076.
2. Kim, J. D.; Lee, M. H.; Han, G.; Park, H.; Zee, O. P.; Jung Y. H. *Tetrahedron* **2001**, 57, 8257-8266.
3. Kim, J. D.; Han. G.; Jeong, L. S.; Park, H.; Zee, O. P.; Jung, Y. H. *Tetrahedron* **2002**, 58, in press.