T. BUYCK, Q. WANG, J. ZHU* (ÉCOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE, SWITZERLAND)

Catalytic Enantioselective Michael Addition of α -Aryl- α -Isocyanoacetates to Vinyl Selenone: Synthesis of α,α -Disubstituted α -Amino Acids and (+)- and (–)-Trigonoliimine A
Angew. Chem. Int. Ed. **2013**, 52, 12714–12718.

Organocatalytic Total Syntheses of (+)- and (–)-Trigonoliimine A

Significance: The Zhu group reports an enantioselective Michael addition of methyl α -aryl- α -isocyanoacetates to vinyl phenylselenone catalyzed by a cinchona-alkaloid derivative. The obtained enantioenriched α -aryl- α -(2'-phenylselenonyl-ethyl)- α -isocyanoacetates are successfully transformed into linear and cyclic quaternary α -amino acids, oxindoles, and pyrrolidinones. A concise total synthesis of (+) and (–)-trigonoliimine A (9 steps, 7.5% and 6.8% overall yield) from the shown Michael adduct was completed via a modified Bischler–Napieralski cyclization.

SYNFACTS Contributors: Benjamin List, Philip S. J. Kaib
Synfacts 2014, 10(1), 0093 Published online: 13.12.2013
DOI: 10.1055/s-0033-1340402; Reg-No.: B11413SF

Comment: α -Isocyanoacetates are well-established glycine templates for the synthesis of racemic α,α -disubstituted α -amino acids. Yet, the catalytic enantioselective allylation of α -isocyanoacetates remains underexploited. The reported Michael addition products are converted further without racemization into the corresponding amines and azides. The absolute configuration of the products obtained from the shown cinchona-alkaloid catalyst was determined after derivatization by X-ray analysis to be *R*.

Category

Organo- and Biocatalysis

Key words

Michael addition
cinchona alkaloid
trigonoliimine A