Catalytic Enantioselective Michael Addition of α-Aryl-α-Isocyanoacetates to Vinyl Selenone: Synthesis of α,α-Disubstituted α-Amino Acids and (+)- and (–)-Trigonoliimine A


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.

**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 $R$. 