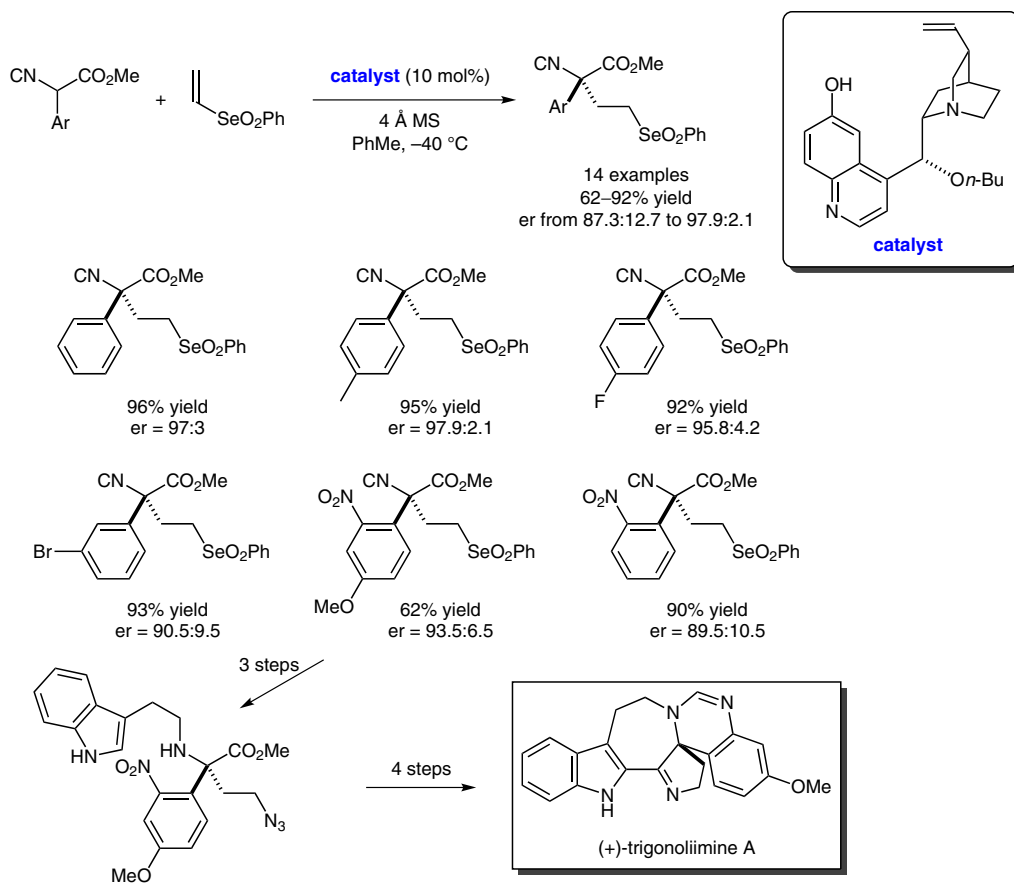


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Catalytic Enantioselective Michael Addition of  $\alpha$ -Aryl- $\alpha$ -Isocyanoacetates to Vinyl Selenone: Synthesis of  $\alpha,\alpha$ -Disubstituted  $\alpha$ -Amino Acids and (+)- and (–)-Trigonoliimine A  
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## Organocatalytic Total Syntheses of (+)- and (–)-Trigonoliimine A



**Significance:** The Zhu group reports an enantioselective Michael addition of methyl  $\alpha$ -aryl- $\alpha$ -isocyanoacetates to vinyl phenylselenone catalyzed by a cinchona-alkaloid derivative. The obtained enantioenriched  $\alpha$ -aryl- $\alpha$ -(2'-phenylselenonyl-ethyl)- $\alpha$ -isocyanoacetates are successfully transformed into linear and cyclic quaternary  $\alpha$ -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.

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**Comment:**  $\alpha$ -Isocyanoacetates are well-established glycine templates for the synthesis of racemic  $\alpha,\alpha$ -disubstituted  $\alpha$ -amino acids. Yet, the catalytic enantioselective allylation of  $\alpha$ -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