Category

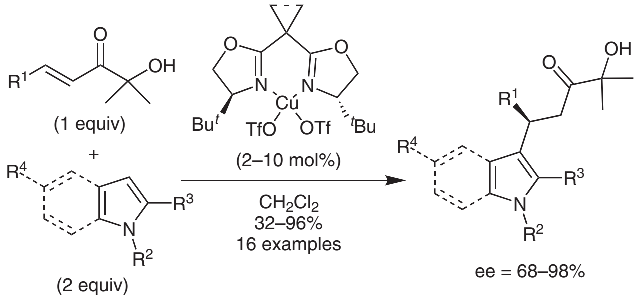
Metal-Catalyzed Asymmetric Synthesis and Stereoselective Reactions

Key Words

copper(II)
bis(oxazoline)
Friedel–Crafts
indoles
pyrroles

C. PALOMO,* M. OIARBIDE, B. G. KARDAK, J. M. GARCIA, A. LINDEN (UNIVERSIDAD DEL PAÍS VASCO, SAN SEBASTIÁN, SPAIN)
Highly Enantioselective Friedel-Crafts Alkylations of Pyrroles and Indoles with α′-Hydroxy Enones under Cu(II)-Simple Bis(oxazoline) Catalysis
J. Am. Chem. Soc. **2005**, *127*, 4154-4155.

Enantioselective Friedel–Crafts Alkylations of Pyrroles and Indoles via α′-Hydroxyenones



Significance: The Friedel–Crafts reaction is of great value in organic synthesis. In terms of metal-catalyzed Friedel–Crafts alkylations, there are few examples demonstrating high enantioselectivity. In many of the reported cases, strongly coordinating bidentate Michael acceptors are required for good enantiocontrol. Presented herein, non-enolizable α′-hydroxyenones represent the above characteristics and, in the presence of easily accessible *tert*-butyl-bis(oxazoline) Cu(II) complexes and electron-rich heteroaromatics, provide highly enantioenriched Friedel–Crafts alkylation products. This method is efficient with both pyrrole and indole as nucleophile, and with alkyl or aryl β-substituents.

Comment: The Cu(II)-*t*-BOX-enone complex makes the enone *Si* face accessible for nucleophilic attack. Although numerous alkyl and aryl β-substituents were tested, it is noted that aryl β-substituents resulted in a marked reduction in ee. Electron-donating substituents on the benzenoid ring of indole had no adverse effects, although electron-withdrawing substituents were not evaluated. Finally, the products of these reactions were elaborated into various examples of pyrrole- and indole-substituted aldehydes, ketones, and carboxylic acids.

SYNFACTS Contributors: Mark Lautens, Andrew Martins
Synfacts 2005, 0, 0036-0036
DOI: 10.1055/s-2005-869945; **Reg-No.:** L01305SF