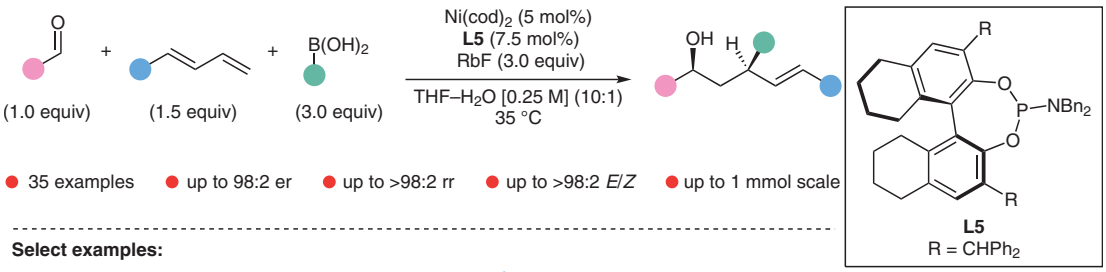
J. S. MARCUM, S. J. MEEK* (UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL, USA)

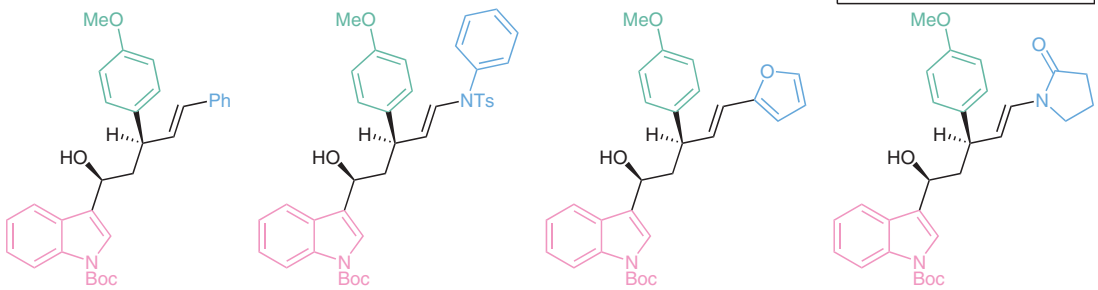
Efficient Enantio-, Diastereo-, *E*/*Z*-, and Site-Selective Nickel-Catalyzed Fragment Couplings of Aldehydes, Dienes, and Organoborons

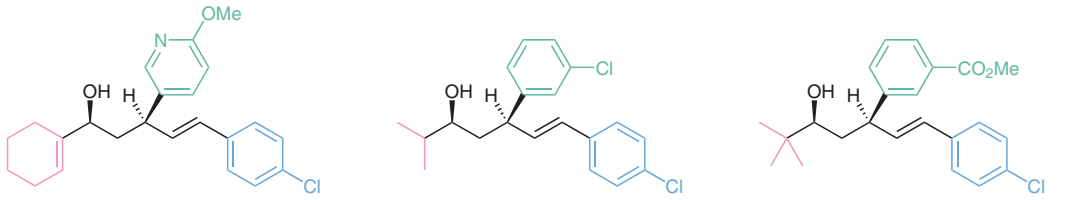
J. Am. Chem. Soc. **2022**, *144*, 19231–19237, DOI: 10.1021/jacs.2c08742.

Nickel-Catalyzed Enantioselective Multicomponent Reaction of 1,3-Dienes, Aldehydes, and Boronic Acids

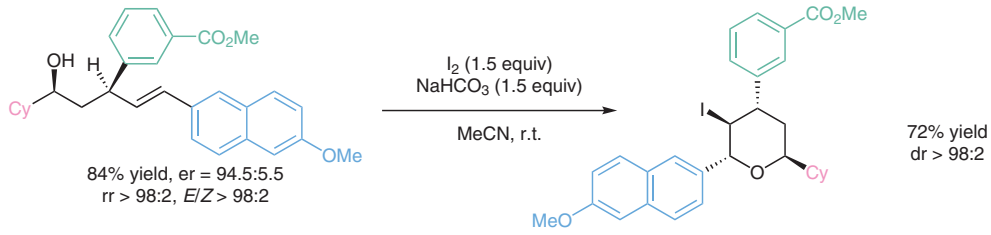


Select examples:





Accessing functionalized tetrahydropyrans:



Significance: Marcum and Meek report a nickel-catalyzed multicomponent coupling reaction of aldehydes, 1,3-dienes, and arylboronic acids. The method is enantio-, diastereo-, and regioselective, affording the olefin products with extremely high *E* selectivity.

Comment: The authors propose that the reaction initiates via an oxidative cyclization of the 1,3-diene and the aldehyde. Subsequent transmetalation with the arylboronic acid and reductive elimination yields the product. Mechanistic studies using D_2O reveal no deuterium is incorporated.

SYNFACTS Contributors: Mark Lautens, Bijan Mirabi
Synfacts 2022, 18(12), 1311 Published online: 17.11.2022
DOI: 10.1055/s-0042-1753065; **Reg-No.:** L14022SF

Category
Metals in Synthesis

Key words
nickel catalysis
multicomponent reaction
1,3-dienes

Synfact of the Month