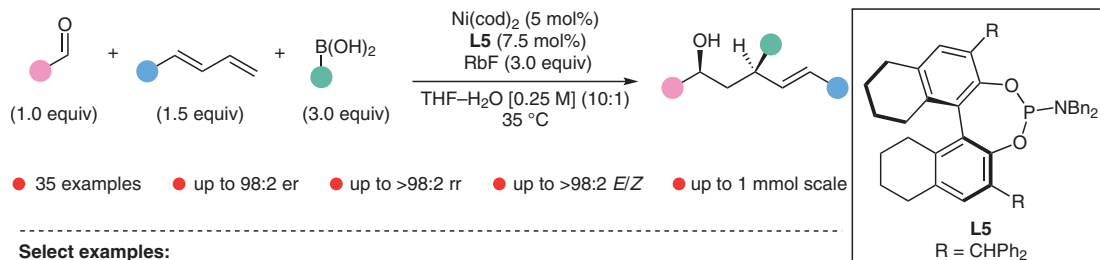
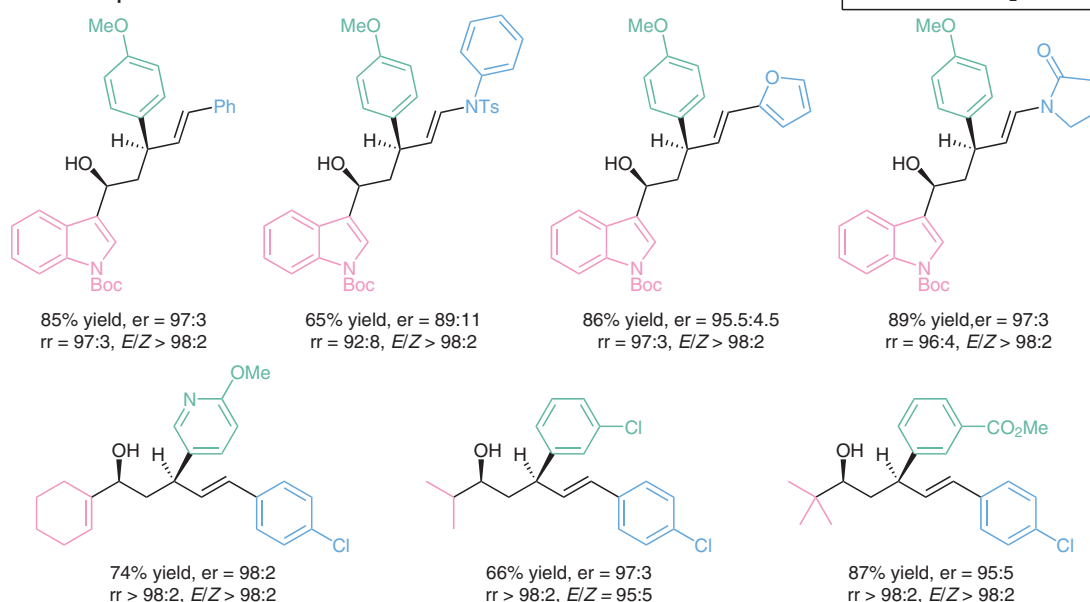


J. S. MARCUM, S. J. MEEK* (UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL, USA)
 Efficient Enantio-, Diastereo-, *E/Z*-, and Site-Selective Nickel-Catalyzed Fragment Couplings of Aldehydes, Dienes, and Organoborons
J. Am. Chem. Soc. **2022**, *144*, 19231–19237, DOI: 10.1021/jacs.2c08742.

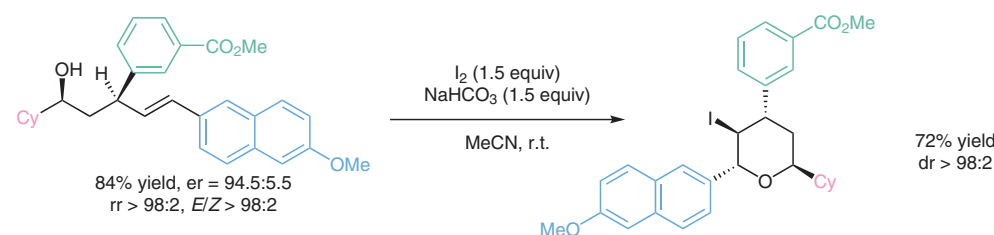
Nickel-Catalyzed Enantioselective Multicomponent Reaction of 1,3-Dienes, Aldehydes, and Boronic Acids



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 D₂O reveal no deuterium is incorporated.

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Category

Metals in Synthesis

Key words

nickel catalysis

multicomponent reaction

1,3-dienes

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