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A General Alkyl–Alkyl Cross-Coupling Enabled by Redox-Active Esters and Alkylzinc Reagents
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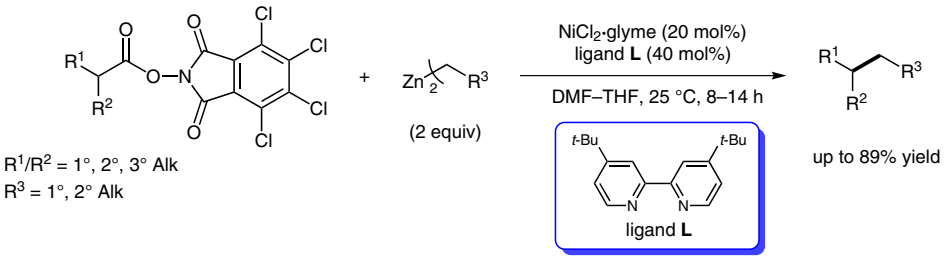
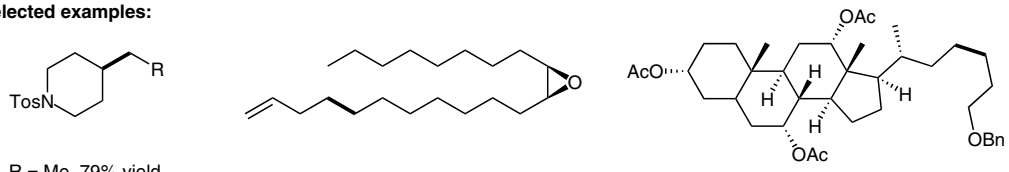
Nickel-Catalyzed Decarboxylative Alkyl–Alkyl Cross-Coupling

Decarboxylative alkyl–alkyl cross-coupling:



R^1/R^2 = 1°, 2°, 3° Alk
R^3 = 1°, 2° Alk

Selected examples:

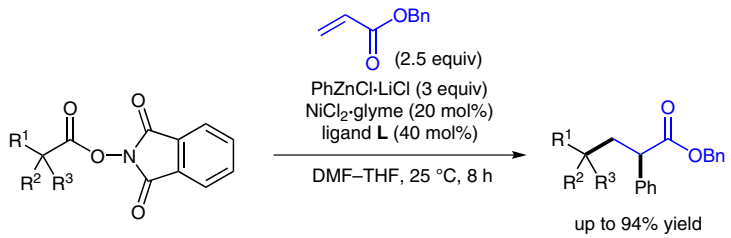


R = Me, 79% yield
R = *n*-C_8H_{17}, 62% yield

42% yield

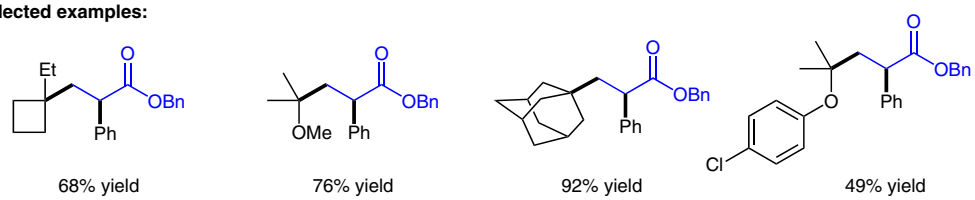
70% yield

Three-component conjunctive cross-coupling:



R^1, R^2 = Alk
R^3 = Alk, O(4-ClC_6H_4), OMe, SMe, N(Me)Boc

Selected examples:



68% yield

76% yield

92% yield

49% yield

Significance: Baran and co-workers report a nickel-catalyzed decarboxylative cross-coupling of redox-active alkyl esters with dialkylzinc reagents by using a bipyridine ligand to afford a variety of products in very high yields. Remarkable are the high functional group tolerances as well as the mild reaction conditions.

Comment: The authors present a three-component conjunctive cross-coupling by employing benzylacrylate as an acceptor molecule. The formation of quaternary centers is accomplished by the formation of two C–C bonds and the corresponding products are obtained in very high yields.

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Category

Metal-Mediated Synthesis

Key words

alkylzinc

decarboxylative cross-coupling

nickel