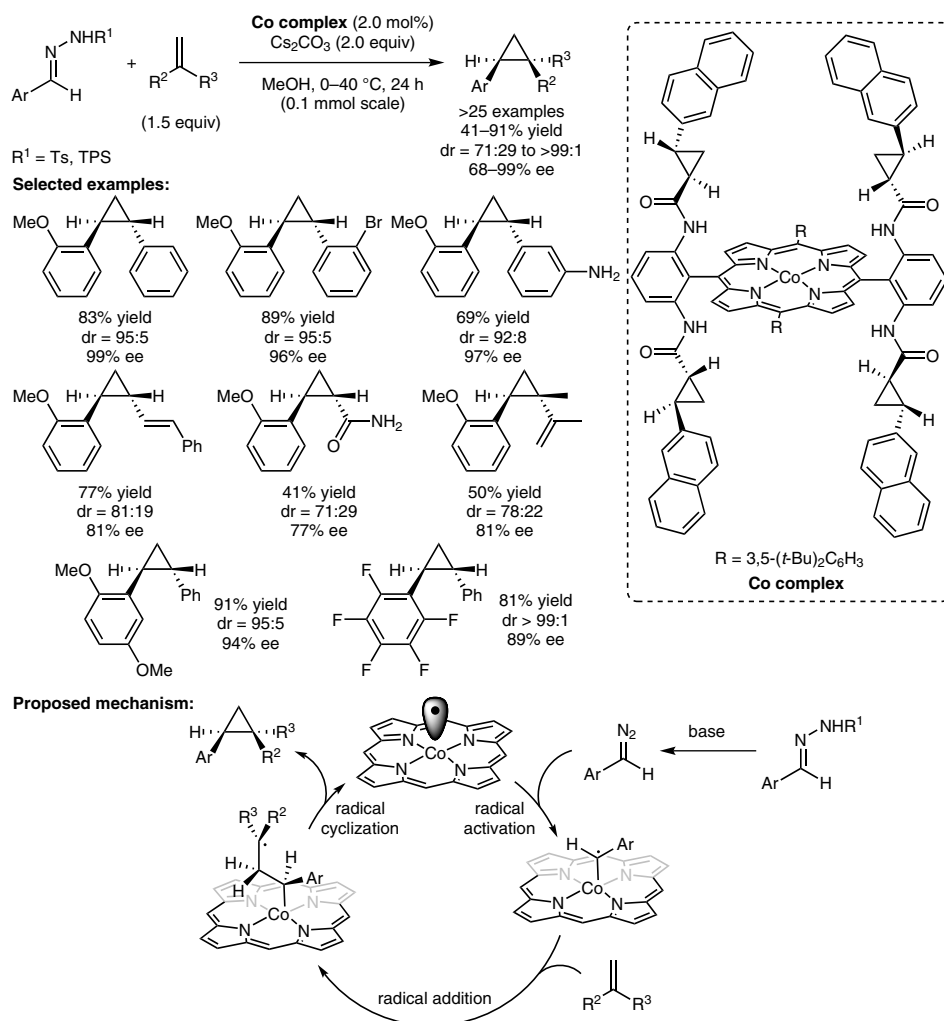


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Asymmetric Radical Cyclopropanation of Alkenes with In Situ-Generated Donor-Substituted Diazo Reagents via Co(II)-Based Metalloradical Catalysis

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Asymmetric Radical Cyclopropanation of Alkenes



Significance: The use of cobalt(II) complexes with chiral amidoporphyrins has emerged as a powerful approach to asymmetric radical transformations. Zhang and co-workers report the use of a chiral cobalt catalyst in the asymmetric radical cyclopropanation of alkenes with diazo reagents to generate enantioenriched substituted cyclopropanes.

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Comment: Diazo reagents, generated in situ from sulfonyl hydrazones under basic conditions, reacted with terminal mono- and disubstituted alkenes to form the corresponding cyclopropane products in good yields and diastereoselectivities, and with excellent enantioselectivities. Mechanistic experiments support a stepwise radical mechanism in which the cobalt complex first reacts with the diazo reagent to form a cobalt(III) benzyl radical followed by radical addition of the alkene.

Category

Metal-Catalyzed
Asymmetric
Synthesis and
Stereoselective
Reactions

Key words

cobalt catalysis

asymmetric radical
reaction

cyclopropanation

diazo reagents

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of the month