W. HAO, J. H. HARENBERG, X. WU, S. N. MACMILLAN, S. LIN* (CORNELL UNIVERSITY, ITHACA, USA AND LUDWIG-MAXIMILIANS-UNIVERSITÄT MÜNCHEN, GERMANY)
Diastereo- and Enantioselective Formal [3+2] Cycloaddition of Cyclopropyl Ketones and Alkenes via Ti-Catalyzed Radical Redox Relay
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Titanium-Catalyzed Stereoselective Formal [3+2] Cycloaddition

Selected examples:

^a with 5 mol% of catalyst

^b at -25 °C for 48 h

Significance: The discovery of new reactions mediated by organic radical intermediates continues to provide solutions to challenging synthetic problems in conventional two-electron chemistry. The authors have developed a Ti-catalyzed stereoselective formal [3+2] cycloaddition of cyclopropyl ketones and alkenes.

SYNFACTS Contributors: Hisashi Yamamoto, Wataru Muramatsu
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Comment: This catalytic cycloaddition through a radical-redox-relay mechanism provides chiral polysubstituted cyclopentane derivatives containing two contiguous stereogenic centers in high yields and with high diastereo- and enantioselectivities.

Category

Metal-Catalyzed Asymmetric Synthesis and Stereoselective Reactions

Key words

titanium catalysis
cycloaddition
cyclopropyl ketones
alkenes

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