R. P. REDDY, H. M. L. DAVIES* (THE STATE UNIVERSITY OF NEW YORK, BUFFALO, USA) Asymmetric Synthesis of Tropanes by Rhodium-Catalyzed [4+3] Cycloaddition J. Am. Chem. Soc. 2007, 129, 10312-10313.

Asymmetric Rhodium-Catalyzed [4+3] Cycloaddition

Significance: A novel methodology for the asymmetric synthesis of tropanes (a popular natural product scaffold) is described using a rhodiumcatalyzed [4+3] cycloaddition between pyrroles and a vinyldiazoacetate. The reaction tolerates a wide range of substituted pyrroles with good yields and excellent enantioselectivities. The products can be an intermediate or a precursor to an intermediate in several previously reported syntheses of biologically active tropanes.

Comment: The reaction proceeds by a tandem cyclopropanation-Cope rearrangement. The best catalyst for this reaction is Rh₂(S-PTAD)₄, which limits the formation of some commonly observed side products. The reaction temperature is critical to achieve high conversions.

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Category

Metal-Catalyzed Asymmetric Synthesis and Stereoselective Reactions

Key words

rhodium

tropanes

[4+3] cycloaddition

