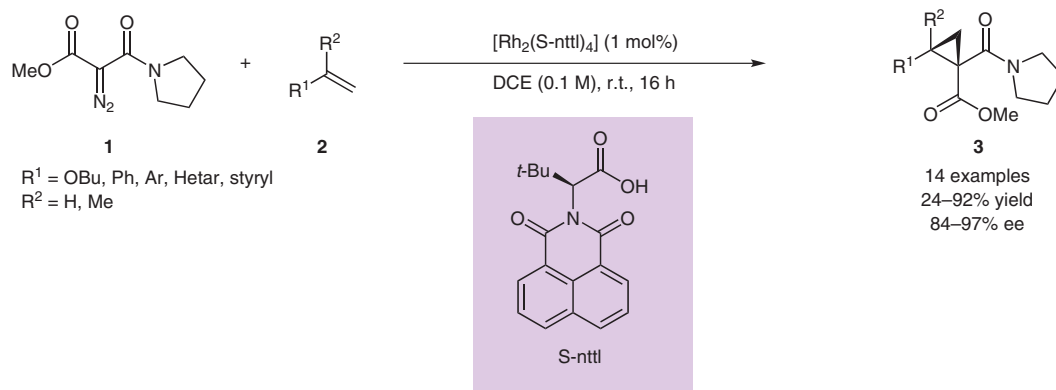


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trans-Directing Ability of Amide Groups in Cyclopropanation: Application to the Asymmetric Cyclopropanation of Alkenes with Diazo Reagents Bearing Two Carboxy Groups*Angew. Chem. Int. Ed.* **2008**, *47*, 10155-10158.

Enantioselective Synthesis of Cyclopropanes Bearing Geminal Carboxy Groups



Significance: The authors report a variation on the classic rhodium-catalyzed cyclopropanation of alkenes with diazo compounds. Chiral cyclopropanes bearing two carboxy groups are a challenging target since the control of enantioselectivity is difficult. The authors obtain these targets in high enantioselectivity and good yields by utilizing α -amido- α -diazoacetate derivatives (**1**).

Book: M. P. Doyle, M. A. McKervey, T. Ye *Modern Catalytic Methods for Organic Synthesis with Diazo Compounds: From Cyclopropanes to Ylides*; Wiley-VCH: New York, **1998**.

Comment: The authors propose an intriguing mechanistic pathway to explain the selectivity in the cyclopropanation with diazo reagents bearing two carboxy groups. It is proposed that the chiral rhodium complex preferentially binds to one face of **1**, thereafter the amide substituent acts as a “*trans*-directing group” and promotes the formation of only one diastereomer. The enantioselectivity is shown to depend on both the ligand used and the substituents on the amide nitrogen. The yields are moderate to good for a variety of alkenes, although aliphatic olefins give poor results. Derivatizations of the resulting products, such as reduction, ring opening and esterification are demonstrated.

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