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Goldberg Active Template Synthesis of a [2]Rotaxane Ligand for Asymmetric Transition-Metal Catalysis
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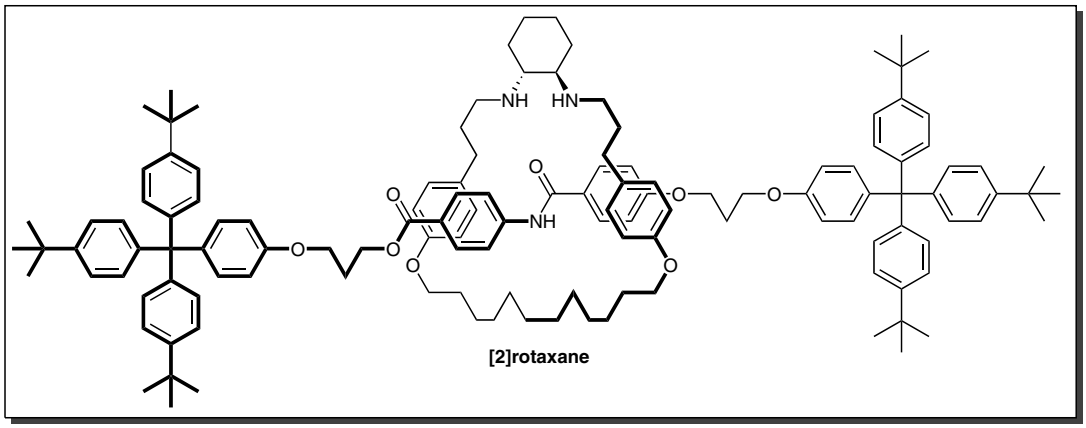
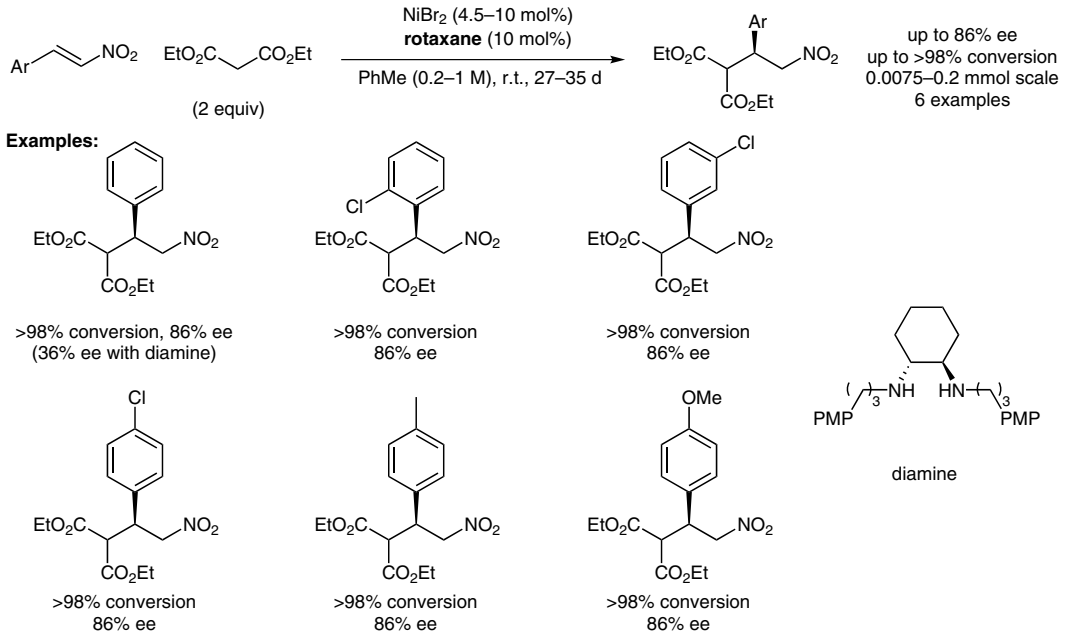
Enantioselective Michael Addition Using a Nickel/Rotaxane Catalyst





Significance: In contrast to traditional ligands, rotaxanes can provide a more well-defined binding pocket leading to enhanced enantioenduction. The authors report the synthesis of the above [2]rotaxane along with its application as a ligand for a nickel-catalyzed Michael addition.

Comment: Although the reaction with rotaxane was considerably slower than with a traditional diamine (27 vs. 2 days) the enantioenduction for the rotaxane was much higher in the nickel-catalyzed process. One drawback of this methodology is the high molecular weight of the ligand (1896 g/mol). On 0.2 mmol scale, 30 mg of nitro olefin requires 38 mg of ligand.

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Category

Metal-Catalyzed Asymmetric Synthesis and Stereoselective Reactions

Key words

nickel

rotaxanes

Michael addition