Cooperative Catalysis with Iron and a Chiral Brønsted Acid for Asymmetric Reductive Amination of Ketones


Asymmetric Reductive Amination of Ketones

Significance: Enantiomerically pure chiral amines are very important building blocks to synthesize numerous pharmaceutical drugs as well as bioactive compounds. The authors report the first iron-catalyzed asymmetric reductive amination of ketones with anilines in the presence of hydrogen, leading to chiral amines in moderate to good yields and good to excellent enantioselectivities.

Comment: The protocol represents a more convenient, simple and practical method for the synthesis of chiral amines. Interestingly, the combination of the chiral Bronsted acid (TRIP) catalyst and the non-chiral Knölker complex enabled the reductive amination of ketones with anilines in a cooperative manner.

Selected examples:

- 60% yield, 84% ee
- 64% yield, 94% ee
- 70% yield, 94% ee
- 80% yield, 73% ee
- 60% yield, 94% ee
- 68% yield, 93% ee
- 74% yield, 93% ee
- 62% yield, 95% ee