Fe(III)-Catalyzed Enantioselective Conia-ene Reaction

Selected examples:

5-membered rings

- Ph \( \text{CO}_2\text{Et} \) 93% yield 93% ee
- \( \text{NO}_2 \) 98% yield 96% ee
- \( \text{CO}_2\text{Me} \) 96% yield 94% ee
- COSPh 90% yield 92% ee

4-, 6-, and 7-membered rings

- Et \( \text{O}_2\text{C} \) 57% yield 82% ee (80 °C in DCE)
- \( \text{NO}_2 \) 91% yield 92% ee
- \( \text{Br} \) 92% yield 96% ee


Comment: The method developed by White and co-workers provides access to the desired carbocycles in generally very high yields (>90%) and enantioselectivities (>90%). In addition to the formation of 5-membered rings, larger (6,7) and smaller (4) rings can also be formed – albeit in lower yields and enantioselectivities in the latter case. The authors propose that the Fe(III) catalyst serves to simultaneously activate the alkyne towards nucleophilic attack, as well as form the key metal enolate species.


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