Base-Free Asymmetric Transfer Hydrogenation of Base-Sensitive Ketones

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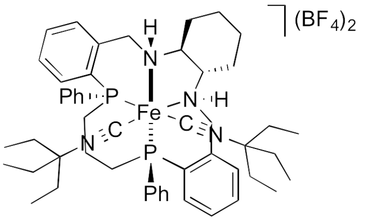
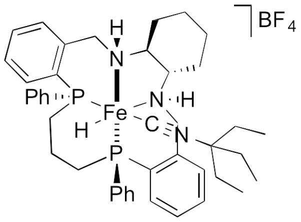
In general, the iron(II) catalysts employed in the asymmetric transfer hydrogenation of ketones (ATH) require basic conditions, which sets severe limitations to the reaction scope. Upon base activation, the catalyst $[Fe(CNR)_2(N_2P_2)]^{2+}$ (**1**) recently reported by our group has shown high activity (up to >99.5% yield) and enantioselectivity (up to 99% ee) in the ATH of polar double bonds. [1] In order to broaden the substrate scope to base sensitive substrates, we prepared the hydrido isonitrile complex **2**, which does not require base activation as it bears the HFeNH motif responsible for hydrogen transfer.

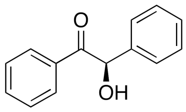


1

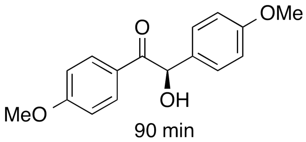


2

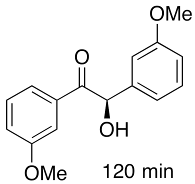
Complex **2** catalyzes the asymmetric transfer hydrogenation of base-sensitive substrates, such as benzils, in good yield and excellent enantioselctivity without the addition of base.



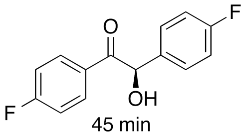
75 min
75%, 95% ee



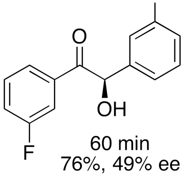
90 min
82%, 73% ee



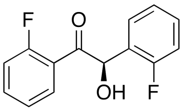
120 min
67%, 87% ee



45 min
75%, 94% ee



60 min
76%, 49% ee



30 min
39%, 62% ee

[1] (a) R. Bigler, A. Mezzetti, *Org. Lett.*, **2014**, *16*, 6460. (b) R. Bigler, R. Huber, A. Mezzetti, *Angew. Chem. Int. Ed.*,**2015**, *54*, 5171. (c) R. Bigler, A. Mezzetti, *Org. Process Res. Dev.*, **2016**, *20*, 253. (d) Bigler, R.; Huber, R.; Stöckli, M.; Mezzetti, A. *ACS Catal.* **2016**, *6*, 6455.