F. G. GELALCHA, B. BITTERLICH, G. ANILKUMAR, M. K. TSE, M. BELLER* (LEIBNIZ-INSTITUT FÜR KATALYSE E.V. AN DER UNIVERSITÄT ROSTOCK, GERMANY) Iron-Catalyzed Asymmetric Epoxidation of Aromatic Alkenes Using Hydrogen Peroxide Angew. Chem. Int. Ed. **2007**, *46*, 7293-7296.

Iron-Catalyzed Epoxidations with Hydrogen Peroxide



Significance: Asymmetric epoxidations give enantioenriched oxiranes which are versatile intermediates in fine chemical synthesis. Currently, most methods involve either atom-inefficient oxidants or the use of expensive transition metals. The authors report an iron catalyst/hydrogen peroxide based method to access chiral oxiranes in high yields and moderate to high enantioselectivities.

Review: Previous work with Ru: M. Beller and coworkers *Chem. Eur. J.* **2006**, *12*, 1855. **Comment:** To date, the combination of iron catalysts and hydrogen peroxide gave only moderate results in epoxidation reactions. Using the new method, chiral oxiranes can be obtained in high yields and enantioselectivities vary with steric bulk in the substrate. Small *ortho* substituents still give good results (only one example). Increasing steric bulk in the *meta*-position diminishes the selectivity and unsymmetrically substituted alkenes can be converted in moderate enantioselectivities. The stereochemistry of the products was proven by derivatization to known compounds. Metal-Catalyzed Asymmetric Synthesis and Stereoselective Reactions

Key words

iron

asymmetric epoxidation

hydrogen peroxide



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 Synfacts 2007, 12, 1271-1271
 Published online: 22.11.2007

 DOI: 10.1055/s-2007-991375; Reg-No.: L13607SF

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