

Publication

Asymmetric Hydrogenation Using Rhodium Complexes Generated from Mixtures of Monodentate Neutral and Anionic Phosphorus Ligands

JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)**ID** 2297496**Author(s)** Frank, Dominik J; Franzke, Axel; Pfaltz, Andreas**Author(s) at UniBasel** [Pfaltz, Andreas](#) ;**Year** 2013**Title** Asymmetric Hydrogenation Using Rhodium Complexes Generated from Mixtures of Monodentate Neutral and Anionic Phosphorus Ligands**Journal** Chemistry, a European journal**Volume** 19**Number** 7**Pages / Article-Number** 2405-15**Keywords** asymmetric catalysis, hydrogenation, phosphanes, phosphoramidites, phosphoric acid diesters

A series of monodentate neutral and anionic phosphorus ligands was synthesized and evaluated in the asymmetric rhodium-catalyzed hydrogenation of functionalized olefins by using either catalysts containing identical ligands or catalysts generated from mixtures of two different ligands. We expected that the combination of an anionic ligand with a neutral ligand would favor the formation of hetero over homo bis-ligand complexes due to charge repulsion. NMR spectroscopic studies confirmed that charge effects can indeed shift the equilibrium toward the hetero bis-ligand complexes. In several cases, the combination of a neutral phosphane with an anionic phosphane, one chiral and the other achiral, furnished significantly higher enantioselectivities than analogous mixtures of two neutral ligands. The best results were obtained with a mixture of an anionic phosphoramidite and a neutral phosphoric acid diester. It is supposed that in this case a hydrogen bond between the two ligands additionally stabilizes the hetero ligand combination.

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