Special Issue

Novel Catalysts for Asymmetric Synthesis

Message from the Guest Editors

The use of enantioselective catalytic procedures provides a wide range of possibilities for using achiral substrates for reactions. In the second half of the 20th century, metal complexes with chiral ligands were commonly used for asymmetric induction, with a constant search for the most effective systems. The tartaric acid esters and their derivatives used by Sharpless for epoxidation successfully competed with Jacobsen's salen complexes. Asymmetric hydrogenation in the presence of chiral rhodium catalysts are considered the greatest advantage among the various systems studied. An important breakthrough was the application of Noyori's Ru-BINAP complex for the asymmetric reduction of ketones and beta-ketoesters. Soon, procedures using metal complexes with chiral ligands of the chemical type for C-H activation appeared, supporting enantioselective transformations in low-reactive aliphatic systems. This concise and selective historical outline shows the continuous and still relevant search for both chiral ligands complexing metals and organocatalysts, providing the greatest stereodifferentiation capabilities for applications in asymmetric synthesis.

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