1,2-Bis-N-[2’-(diphenylphosphino)-benzo/naphtho]-1,2-diamino-cyclohexane – Trost Modular Ligands

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Introduction

Over the past ten years Trost et al. have developed a modular approach to ligand design for the Pd-catalysed asymmetric allylic alkylation (AAA) reaction. Much attention has focused on ligands such as 1a and its variant 1b which, under appropriate conditions, provide outstanding selectivity in a broad range of Pd-catalysed reactions.1,2 It should be noted that the mode of ligand bonding is not exclusively P,P-chelating, as in complexes 2a and 2b, and that ligand coordination is non-C$_2$-symmetric.3 Applications and uses of 1a and 1b are described.

Abstracts

The regioselective 1:1 hydroamination of dienes affords allylic amines in excellent yields. The reaction is broad for a wide range of anilines and proceeds with high enantioselectivity when the naphtho modular ligand 1b is employed.4

The Pd-catalysed AAA reaction of a range of nitroalkanes with acyclic and cyclic allyl esters, employing ligand 1a, proceeds in high yields and enantioselectivities providing that catalyst loadings are low.3,5
The Pd-catalysed desymmetrisation of meso diesters is a proven and highly versatile method for providing monosubstituted products of high ee.  

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\begin{align*}
\text{RO} & \quad \text{OR} \\
\text{a} & \quad \text{b} \\
\text{b} & \quad \text{Carbovir} \\
\text{Aristomycin} & \quad \text{95% ee} \\
\text{94% Yield} & \quad \text{95% ee} \\
\text{80% Yield} & \quad \text{94% Yield}
\end{align*}
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References