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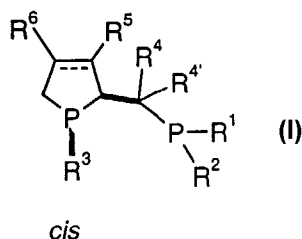
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(54) Title: BIDENTATE C,P CHIRAL PHOSPHINE LIGANDS



(57) **Abstract:** The invention is concerned with new phosphine ligands of formula I wherein R¹ and R² are independently of each other alkyl, aryl, cycloalkyl or heteroaryl, said alkyl, aryl, cycloalkyl or heteroaryl may be substituted by alkyl, alkoxy, halogen, hydroxy, amino, mono- or dialkylamino, aryl, -SO₂-R⁷, -SO₃⁻, -CO-NR⁸BR^{8"}, carboxy, alkoxy carbonyl, trialkylsilyl, diarylalkylsilyl, dialkylarylsilyl or triarylsilyl; R³ is alkyl, cycloalkyl, aryl or heteroaryl; R⁴ and R^{4'} signify independently of each other hydrogen, alkyl or optionally substituted aryl; or R^{4'} and R⁴ together with the C-atom they are attached to form a 3-8-membered carbocyclic ring; dotted line is absent or is present and forms a double bond; R⁵ and R⁶ are independently of each other hydrogen, alkyl or aryl, R⁷ is alkyl or aryl; and R⁸ and R^{8"} are independently of each other hydrogen, alkyl or aryl; the substituents attached by the bold bonds are in *cis*

relation to each other; metal complexes with such ligands as well as the use of such metal complexes as catalysts in asymmetric reactions.



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