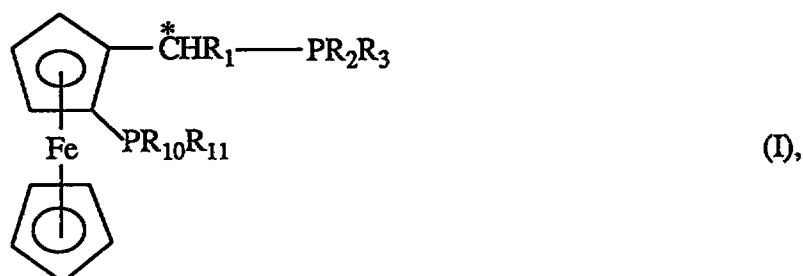


Ferrocene diphosphines as ligands for homogeneous catalystsAbstract of the Disclosure

Compounds of formula I



wherein R_1 is C_1 - C_8 alkyl, phenyl or phenyl which is substituted by 1 to 3 C_1 - C_4 alkyl or C_1 - C_4 alkoxy groups; R_2 and R_3 are each independently of the other typically C_1 - C_{12} alkyl, C_5 - C_{12} cycloalkyl, phenyl, or C_1 - C_4 alkyl- or C_1 - C_4 alkoxy-substituted C_5 - C_{12} cycloalkyl, or phenyl which is substituted by one to three identical or different members selected from the group consisting of C_1 - C_4 alkyl, C_1 - C_4 alkoxy or halogen;

R_{10} and R_{11} are identical and are typically C_1 - C_{12} alkyl, C_5 - C_{12} cycloalkyl, C_1 - C_4 alkyl- or C_1 - C_4 alkoxy-substituted C_5 - C_{12} cycloalkyl or phenyl which is substituted by 1 to 3 identical or different members selected from the group consisting of C_1 - C_4 alkyl, C_1 - C_4 alkoxy or halogen; or R_{10} and R_{11} are different and are C_1 - C_{12} alkyl, C_5 - C_{12} cycloalkyl, C_1 - C_4 alkyl- or C_1 - C_4 alkoxy-substituted C_5 - C_{12} cycloalkyl, phenyl or phenyl which is substituted by 1 to 3 identical or different members selected from the group consisting of C_1 - C_4 alkyl, C_1 - C_4 alkoxy or halogen, and * denotes a stereogenic carbon atom, in the form of their racemates and diastereoisomers or mixtures of diastereoisomers.

Rhodium and iridium complexes with these ligands are suitable for use as homogeneous enantioselective catalysts for the hydrogenation of prochiral compounds containing carbon double bonds or carbon/hetero atom double bonds.