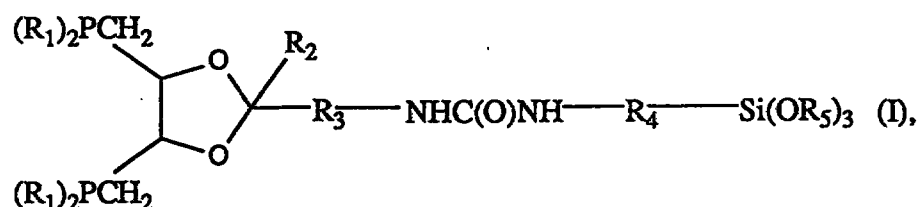


Diphosphines containing silane groups, immobilised diphosphines and the use thereof as hydrogenation catalysts

Abstract of the Disclosure

Compounds of formula I



wherein R_1 denotes identical or different radicals and is linear or branched C_1 - C_{12} alkyl, unsubstituted C_5 - C_6 cycloalkyl or C_5 - C_6 cycloalkyl which is substituted by C_1 - C_4 alkyl or C_1 - C_4 alkoxy, or is phenyl or benzyl, or both substituents R_1 of a group $(R_1)_2P$ are o,o'-diphenylene, R_2 is hydrogen, linear or branched C_1 - C_{12} alkyl, phenyl or benzyl, R_3 is C_1 - C_{12} alkylene, R_4 is C_2 - C_{18} alkylene, phenylene or benzylene, and R_5 is C_1 - C_6 alkyl or phenyl, can be applied to solid carriers, such as silica gel or aerosils, and complexed with rhodium or iridium compounds. These materials are heterogeneous and separable catalysts for the asymmetrical hydrogenation of prochiral compounds containing carbon double bonds or carbon/hetero atom double bonds, for example ketones and imines.