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**(54) Title (EN):** CHIRAL SPIRO-PYRIDYLAMIDOPHOSPHINE LIGAND COMPOUND, SYNTHESIS METHOD THEREFOR AND APPLICATION THEREOF

**(54) Title (FR):** COMPOSÉ DE LIGAND SPIRO-PYRIDYLAMIDOPHOSPHINE CHIRAL, PROCÉDÉ DE SYNTHÈSE ET APPLICATION DE CELUI-CI

**(54) Title (ZH):** 手性螺环吡啶胺基磷配体化合物与合成方法及其应用

**(57) Abstract:**

**(EN):** The present invention relates to a chiral spiro-pyridylamidophosphine ligand compound, synthesis method therefor and application thereof. The chiral spiro-pyridylamidophosphine compound is a compound having a structure of Formula (I), a raceme

or optical isomer thereof, or a catalytically acceptable salt thereof, and is mainly characterized by having a chiral spiro-dihydro-indene skeleton in its structure. The chiral spiro-pyridylamidophosphine compound may be synthesized with optical active 7-diaryl/alkylphosphino-7'-amino-1,1'-spiro-dihydro-indene or substituted 7-diaryl/alkylphosphino-7'-amino-1,1'-spiro-dihydro-indene having a spiro-skeleton as chiral starting material. The chiral spiro-pyridylamidophosphine compound may be used as a chiral ligand in asymmetric hydrogenation of a carbonyl compound catalyzed by iridium, in which the reaction activity is very high, the amount of the catalyst may be 0.0001 mol%, and the enantioselectivity of the reaction is up to 99.9% ee.

**(FR):** La présente invention concerne un composé de ligand spiro-pyridylamidophosphine chiral, un procédé de synthèse de celui-ci et l'application de celui-ci. Le composé spiro-pyridylamidophosphine chiral est un composé ayant une structure de formule (I), un racémique ou un isomère optique de celui-ci, ou un sel acceptable sur le plan catalytique de celui-ci, et est principalement caractérisé en ce qu'il a un squelette spiro-dihydro-indène dans sa structure. Le composé spiro-pyridylamidophosphine chiral peut être synthétisé avec un 7-diaryl/alkylphosphino-7'-amino-1,1'-spiro-dihydro-indène ou 7-diaryl/alkylphosphino-7'-amino-1,1'-spiro-dihydro-indène substitué optiquement actif ayant un spiro-squelette en tant que matériau de départ chiral. Le composé spiro-pyridylamidophosphine chiral peut être utilisé en tant que ligand chiral dans l'hydrogénation asymétrique d'un composé carbonyle catalysée par l'iridium, dans laquelle l'activité de réaction est très élevée, la quantité du catalyseur peut être de 0,0001 % en moles, et l'énantioselectivité de la réaction est de jusqu'à 99,9 % en énantiomère.

**(ZH):** 本发明涉及一种手性螺环吡啶胺基膦配体化合物与合成方法及其应用。该手性螺环吡啶胺基膦化合物是具有式I结构的化合物,或其消旋体或旋光异构体,或其催化可接受的盐,主要结构特征是具有手性螺二氢茛骨架。该手性螺环吡啶胺基膦化合物可以由具有螺环骨架的光学活性的7-二芳/烷基膦基-7'-氨基-1,1'-螺二氢茛或取代的7-二芳/烷基膦基-7'-羧基-1,1'-螺二氢茛为手性起始原料合成。该手性螺环吡啶胺基膦化合物可作为手性配体用于铱催化的羰基化合物的不对称催化氢化反应中,反应的活性也很高,催化剂的用量可以为0.0001%摩尔,反应的对映选择性达到99.9% ee。

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