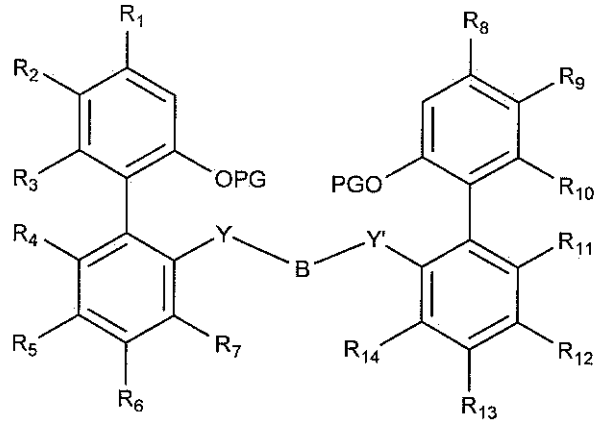
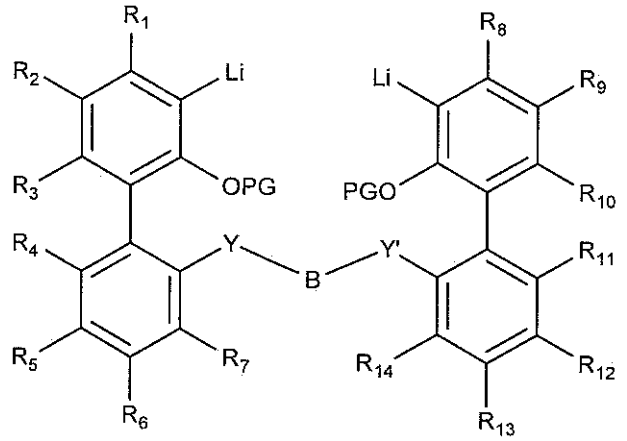
[0030] The present disclosure further provides a ligand of formula (I) or formula (XIV) prepared by any one of the hereinbefore disclosed methods.

[0030a] In another aspect, there is provided a method of preparing a dilithio protected bi-aromatic phenol of formula (III), the method comprising treating a protected bi-aromatic phenol of formula (II) with a lithiating agent to yield the dilithio protected bi-aromatic phenol of formula (III)



(II)



(III)

wherein each of R^1, R^2, R^3, R^4, R^5, R^6, R^7, R^8, R^9, R^{10}, R^{11}, R^{12}, R^{13} and R^{14} is independently selected from the group consisting of hydride, halide, optionally substituted hydrocarbyl, heteroatom-containing optionally substituted hydrocarbyl, alkoxy, aryloxy, silyl, boryl, dialkyl amino, alkylthio, arylthio and seleno; optionally two or more R groups can combine together into ring structures with such ring structures having from 3 to 100 non-hydrogen atoms in the ring; B is a bridging group having from one to 50 non-hydrogen atoms; Y and Y' are independently selected from O, S, NR^a and PR^a wherein R^a is optionally substituted hydrocarbyl; PG is a protecting group.

BRIEF DESCRIPTION OF THE DRAWINGS

[0031] Figure 1 depicts the chemical structures of exemplary compounds in accordance with this disclosure.

[0032] Figure 2 depicts an exemplary reaction scheme in accordance with this disclosure.

[0033] Figure 3 depicts an exemplary reaction scheme in accordance with this disclosure.

DETAILED DESCRIPTION

[0034] Before the present compounds, components, compositions, and/or methods are disclosed and described, it is to be understood that unless otherwise indicated this invention is not limited to specific compounds, components, compositions, reactants, reaction conditions, ligands, metallocene structures, or the like, as such may vary, unless otherwise specified. It is also to be understood that the terminology used herein is for the purpose of describing particular embodiments only and is not intended to be limiting.

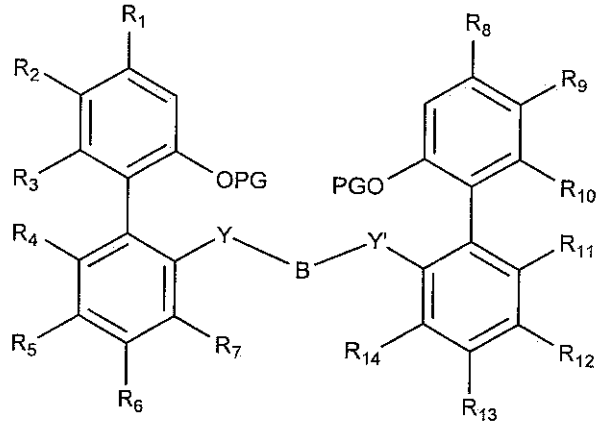
[0035] It must also be noted that, as used in the specification and the appended claims, the singular forms "a," "an" and "the" include plural referents unless otherwise specified. Thus, for example, reference to "a halogen atom" as in a moiety "substituted with a halogen atom" includes more than one halogen atom, such that the moiety may be substituted with two or more halogen atoms, reference to "a substituent" includes one or more substituents, reference to "a ligand" includes one or more ligands, and the like.

[0036] As used herein, all reference to the Periodic Table of the Elements and groups thereof is to the NEW NOTATION published in HAWLEY'S CONDENSED CHEMICAL DICTIONARY, Thirteenth Edition, John Wiley & Sons, Inc., (1997) (reproduced there with permission from IUPAC), unless reference is made to the Previous IUPAC form noted with Roman numerals (also appearing in the same), or unless otherwise noted.

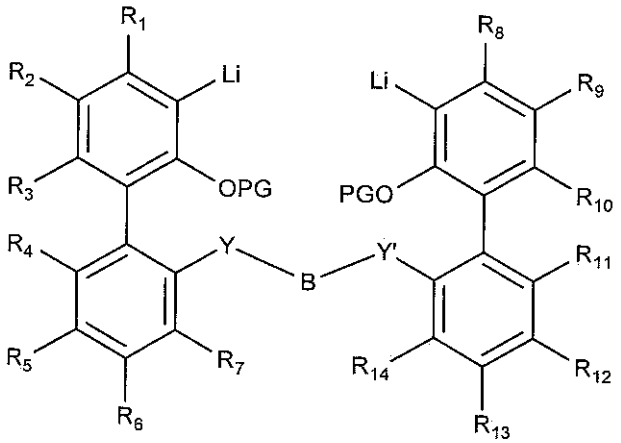
[0037] Disclosed herein are methods for preparing bridged bi-aromatic ligands which are advantageous in comparison to known preparation methods. The disclosed methods make use of direct and selective di-ortho lithiation of protected phenols which greatly reduces the number of required reaction steps. The ligands find use in the preparation of transition metal compounds useful as catalysts in olefin polymerization.

wherein the palladium phosphine compound comprises bis(tri-tert-butylphosphine)palladium.

10. A method of preparing a dilithio protected bi-aromatic phenol of formula (III), the method comprising treating a protected bi-aromatic phenol of formula (II) with a lithiating agent to yield the dilithio protected bi-aromatic phenol of formula (III)



(II)



(III)

wherein each of R^1, R^2, R^3, R^4, R^5, R^6, R^7, R^8, R^9, R^{10}, R^{11}, R^{12}, R^{13} and R^{14} is independently selected from the group consisting of hydride, halide, optionally substituted hydrocarbyl, heteroatom-containing optionally substituted hydrocarbyl, alkoxy, aryloxy, silyl, boryl, dialkyl amino, alkylthio, arylthio and seleno; optionally two or more R groups can combine together into ring structures with such ring structures having from 3 to 100 non-hydrogen atoms in the ring; B is a bridging group having from one to 50 non-hydrogen atoms; Y and Y' are independently selected from O, S, NR^a and PR^a wherein R^a is optionally substituted hydrocarbyl; PG is a protecting group.