In the above methods i-iii, in addition to the compound as shown in Formula I, the internal electron donor of the catalyst component further comprises at least one compound selected from esters, ethers, ketones, and amines, preferably from diol ester compounds, diester compounds, diether compounds, or polybasic aliphatic/aromatic carboxylic acid esters, including the polybasic carboxylic acid esters disclosed in CN85100997, the content of which is incorporated to the present invention, are preferred.

The present invention also provides a catalyst for olefin polymerization, comprising a ~~reactant~~ reaction product of the following components:

a. the above catalyst component, which comprises the imine compound as shown in Formula or prepared by any one of the above methods i, ii, and iii;

b. an organoaluminium compound;

c. an unessential component organosilicon compound.

According to the present invention, calculated based on per mole titanium compound, the dosage ratio of the components is a:b:c＝1 mol:20-800 mol:0-100 mol.

Further, the organoaluminium compound is represented by formula $AlR^e_rY_{3-r}$, wherein R^e is hydrogen or C_1-C_{20} hydrocarbyl, Y is halogen, r is an integer and $0 < r \leq 3$. Specific example of the organoaluminium compound is selected from at least one trimethyl aluminium, triethyl aluminium, tri isobutyl aluminium, trioctyl aluminium, diethylaluminium chloride, diisobutylaluminium chloride, diethylaluminium chloride, diisobutylaluminium chloride, dichloroethyl aluminium, and dichloroethylaluminium, preferably from triethyl aluminium and/or triisobutyl aluminium.

In the above catalyst, for obtaining an olefin polymer with high stereoregularity, an external electron donor needs to be added, the external electron donor being, for example, an organosilicon compound which is as shown in Formula $R^f_sSi(OR^g)_{4-s}$, in which $0 \leq s \leq 3$, R^f and R^g are independently selected from alkyl, cycloalkyl, aryl, halogenated alkyl, or amino, and R^f also can be halogen atom, or hydrogen atom. Preferably, the organosilicon compound is at least one selected from the following organosilicon compounds: trimethylmethoxysilicane,

containing 1.3 g of 2,6-dimethyl aniline. The resulting mixture was stirred and reacted for 2 hours, heated to 90 ºC to perform a reflux reaction for 18 hours. After the reaction solution was concentrated under reduced pressure, a white solid was obtained. The solid was recrystallized with ethanol to obtain a white crystal of 1.12 g (the yield was 61%). ^{1}H-NMR (δ, ppm, TMS, $CDCl_3$): 7.96- 7.76 (5H, m, Ar*H*), 7.66 -7.46 (3H, m, Ar*H*), 2.12-2.23 (2H, m, CH_2), 2.12-2.23 (2H, m, CH_2), 2.26-2.38 (12H, m, CH_3), 2.01-2.02 (2H, s, CH_2), 1.01-1.12 (3H, m, CH_3); mass spectrum, FD-mass spectrometry: 368.

Example 1A-11 Synthesis of compound 3,5-di(2,6-diisopropylphenylimino)heptane

1.28 g of 3,5-heptadione, 80 mL of isopropanol, and 0.5 mL of acetic acid were placed into a three-neck 250 mL flask replaced by nitrogen gas, and were mixed uniformly by stirring at room temperature, followed by, at room temperature, a slow addition of 20 mL of isopropanol solution containing 3.68 g of 2,6-diisopropyl aniline. The resulting mixture was stirred and reacted for 2 hours, heated to 90 ºC to perform a reflux reaction for 36 hours. After the reaction solution was concentrated under reduced pressure, a yellow solid was obtained. The solid was purified with a column to obtain a light yellow liquid of 2.36 g (the yield was 53%). ^{1}H-NMR (δ, ppm, TMS, $CDCl_3$): 7.46-7.78 (6H, m, Ar*H*), 3.21-3.36 (4H, m, C*H*), 2.12-2.23 (2H, m, CH_2), 1.58-1.86 (4H, m, CH_2), 1.26-1.38 (24H, m, CH_3), 0.97-1.21 (6H, m, CH_3);mass spectrum, FD-mass spectrometry: 446.

Example 1A-12 Synthesis of compound 2-(2-naphthylimino)-4-(4-trifluorophenylimino)pentane

1.1 g of acetylacetone, 100 mL of methylbenzene, and 0.35 g of p-methylbenzenesulfonic acid were placed into a three-neck flask replaced by nitrogen gas, and were mixed uniformly by stirring at room temperature, followed by, at room temperature, a slow addition of 1.43 g of 2-naphthylamine. The resulting mixture was heated to 130 ºC to perform a reflux reaction for 30 hours with water being separated. After the mixture was cooled to room temperature, 1.62 g of 4-trifluoromethyl aniline was added, followed by a reflux reaction for 36 hours with water being separated. The ~~reactant~~ reaction solution was concentrated under reduced pressure to remove the solvent.