# CLAIMS

1. A solid catalyst component for olefin polymerization that is produced by suspending (a) a dialkoxymagnesium, and (b) at least one alcohol selected from ethanol, n-propanol, n-butanol, isopropanol, isobutanol, and t-butanol, in an inert organic solvent so that a total amount of the alcohol is 0.5 to 1.5 parts by mass based on 100 parts by mass of the dialkoxymagnesium, to prepare a suspension, and bringing (c) an internal electron donor and (d) a titanium halide compound into contact with the suspension.

2. An olefin polymerization catalyst comprising:

(α) the solid catalyst component according to claim 1;

(β) an organoaluminum compound represented by a general formula (I),

$$R^1_pAlQ_{3-p} \qquad (I)$$

wherein $R^1$ is a hydrocarbyl group having 1 to 6 carbon atoms, provided that a plurality of $R^1$ are either identical or different when a plurality of $R^1$ are present, Q is a hydrogen atom, a hydrocarbyloxy group having 1 to 6 carbon atoms, or a halogen atom, provided that a plurality of Q are either identical or different when a plurality of Q are present, and p is a real number that satisfies $0<p\leq3$; and

(γ) an external electron donor compound.

3. The olefin polymerization catalyst according to claim 2, wherein the external electron donor compound (γ) is one or more compounds selected from an organosilicon compound represented by a general formula (II) and an aminosilane compound represented by a general formula (III),

$$R^2_qSi(OR^3)_{4-q} \qquad (II)$$

wherein $R^2$ is an alkyl group having 1 to 12 carbon atoms, a vinyl group, an alkenyl group having 3 to 12 carbon atoms, a cycloalkyl group having 3 to 12 carbon atoms, a

cycloalkenyl group having 3 to 12 carbon atoms, an aromatic hydrocarbon group having 6 to 15 carbon atoms, or a substituted aromatic hydrocarbon group having 6 to 15 carbon atoms, provided that a plurality of $R^2$ are either identical or different when a plurality of $R^2$ are present, $R^3$ is an alkyl group having 1 to 4 carbon atoms, a vinyl group, an alkenyl group having 3 to 12 carbon atoms, a cycloalkyl group having 3 to 6 carbon atoms, an aromatic hydrocarbon group having 6 to 12 carbon atoms, or a substituted aromatic hydrocarbon group having 7 to 12 carbon atoms, provided that a plurality of $R^3$ are either identical or different when a plurality of $R^3$ are present, and q is an integer from 0 to 3,

$$(R^4R^5N)_sSiR^6_{4-s} \qquad \text{(III)}$$

wherein $R^4$ and $R^5$ are a hydrogen atom, an alkyl group having 1 to 20 carbon atoms, a vinyl group, an alkenyl group having 3 to 20 carbon atoms, a cycloalkyl group having 3 to 20 carbon atoms, a cycloalkenyl group having 3 to 20 carbon atoms, or an aryl group having 6 to 20 carbon atoms, provided that $R^4$ and $R^5$ that form the $R^4R^5N$ group are either identical or different, and optionally bond to each other to form a ring, and a plurality of $R^4R^5N$ groups are either identical or different when a plurality of $R^4R^5N$ groups are present, $R^6$ is an alkyl group having 1 to 20 carbon atoms, a vinyl group, an alkenyl group having 3 to 12 carbon atoms, an alkoxy group having 1 to 20 carbon atoms, a vinyloxy group, an alkenyloxy group having 3 to 20 carbon atoms, a cycloalkyl group having 3 to 20 carbon atoms, a cycloalkyloxy group having 3 to 20 carbon atoms, an aryl group having 6 to 20 carbon atoms, or an aryloxy group having 6 to 20 carbon atoms, provided that a plurality of $R^6$ are either identical or different when a plurality of $R^6$ are present, and s is an integer from 1 to 3.

4. The olefin polymerization catalyst according to claim 3, wherein the external electron donor compound (γ) is phenyltrimethoxysilane, n-butyltrimethoxysilane, cyclopentyltrimethoxysilane, cyclohexyltrimethoxysilane, phenyltriethoxysilane,

n-butyltriethoxysilane, cyclopentyltriethoxysilane, cyclohexyltriethoxysilane, t-butylmethyldimethoxysilane, t-butylethyldimethoxysilane, diisopropyldimethoxysilane, diisobutyldimethoxysilane, diisopentyldimethoxysilane, diphenyldimethoxysilane, dicyclopentyldimethoxysilane, cyclohexylmethyldimethoxysilane, cyclohexylcyclopentyldimethoxysilane, tetramethoxysilane, tetraethoxysilane, t-butylmethylbis(ethylamino)silane, dicyclohexylbis(ethylamino)silane, dicyclopentylbis(ethylamino)silane, bis(perhydroisoquinolino)dimethoxysilane, diethylaminotrimethoxysilane, or diethylaminotriethoxysilane.

5. The olefin polymerization catalyst according to claim 2, wherein the external electron donor compound (γ) is one or more compounds selected from a diether compound represented by a general formula (IV),

$$R^7OCH_2CR^8R^9CH_2OR^{10} \qquad (IV)$$

wherein $R^8$ and $R^9$ are a hydrogen atom, a halogen atom, an alkyl group having 1 to 12 carbon atoms, a vinyl group, an alkenyl group having 3 to 12 carbon atoms, a cycloalkyl group having 3 to 12 carbon atoms, a cycloalkenyl group having 3 to 12 carbon atoms, an aromatic hydrocarbon group having 6 to 12 carbon atoms, a halogen-substituted aromatic hydrocarbon group having 6 to 12 carbon atoms, a substituted aromatic hydrocarbon group having 7 to 12 carbon atoms, an alkylamino group having 1 to 12 carbon atoms, or a dialkylamino group having 2 to 12 carbon atoms, provided that $R^8$ and $R^9$ are either identical or different, and optionally bond to each other to form a ring, and $R^7$ and $R^{10}$ are an alkyl group having 1 to 12 carbon atoms, a vinyl group, an alkenyl group having 3 to 12 carbon atoms, a cycloalkyl group having 3 to 6 carbon atoms, an aromatic hydrocarbon group having 6 to 12 carbon atoms, a halogen-substituted aromatic hydrocarbon group having 6 to 12 carbon atoms, or a substituted aromatic hydrocarbon group having 7 to 12 carbon atoms, provided that $R^7$

and $R^{10}$ are either identical or different.

6. The olefin polymerization catalyst according to claim 5, wherein the diether compound is 2-isopropyl-2-isobutyl-1,3-dimethoxypropane or 9,9-bis(methoxymethyl)fluorene.

7. A method for producing an olefin polymer comprising polymerizing an olefin in the presence of the olefin polymerization catalyst according to any one of claims 2 to 6.

## Claims

1. An invention not claimed in any divisional application.