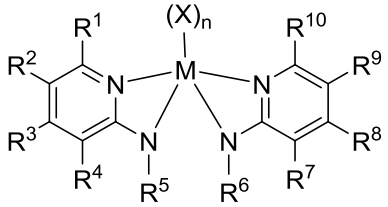
CLAIMS

1. An olefin polymerization catalyst system comprising a procatalyst component selected from metal-ligand complexes of Formula (I):



(I)

wherein M is titanium, zirconium, or hafnium;

wherein each X is independently a monodentate or polydentate ligand that is neutral, monoanionic, or dianionic, wherein n is an integer, and wherein X and n are chosen in such a way that the metal-ligand complex of Formula (I) is overall neutral;

wherein each R^1 and R^{10} independently is selected from the group consisting of (C_6-C_{40})aryl, substituted (C_6-C_{40})aryl, (C_3-C_{40})heteroaryl, and substituted (C_3-C_{40})heteroaryl;

wherein each R^2, R^3, R^4, R^7, R^8, and R^9 independently is selected from a group consisting of hydrogen; (C_1-C_{40})hydrocarbyl; substituted (C_1-C_{40})hydrocarbyl; (C_1-C_{40})heterohydrocarbyl; substituted (C_1-C_{40})heterohydrocarbyl; halogen; and nitro (NO_2);

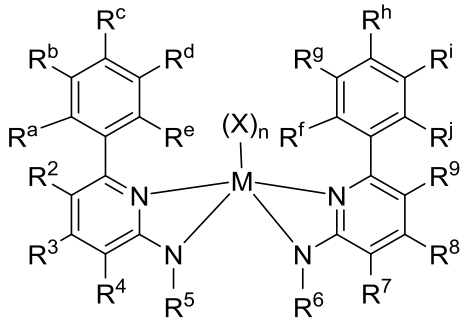
wherein each R^5 and R^6 independently is selected from the group consisting of a (C_1-C_{40})alkyl; substituted (C_1-C_{40})alkyl; [$(Si)_1$-$(C+Si)_{40}$] substituted organosilyl;

optionally, two or more of the R^{1-5} groups are combined together to form a ring structure, with such ring structure having from 5 to 16 atoms in the ring excluding any hydrogen atoms; and

optionally, two or more of the R^{6-10} groups are combined together to form a ring structure, with such ring structure having from 5 to 16 atoms in the ring excluding any hydrogen atoms.

2. The olefin polymerization catalyst system according to claim 1, wherein each X independently is Me, Bn, or Cl.

3. The olefin polymerization catalyst system according to any one of the preceding claims, wherein R^1 and R^{10} are substituted phenyl groups and the metal-ligand complex has Formula (II):



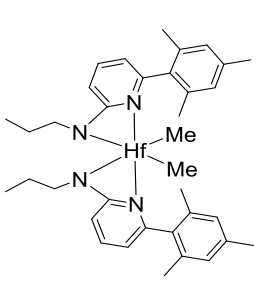
(II)

wherein R^a-R^j are each independently selected from the group consisting of R^S substituents and hydrogen; and wherein each R^S independently is a halogen atom, polyfluoro substitution, perfluoro substitution, unsubstituted (C_1-C_{18})alkyl, (C_6-C_{18})aryl, F_3C, FCH_2O, F_2HCO, F_3CO, $(R^Z)_3Si$, $(R^Z)3Ge$, $(R^Z)O$, $(R^Z)S$, $(R^Z)S(O)$, $(R^Z)S(O)_2$, $(R^Z)_2P$, $(R^Z)_2N$, $(R^Z)_2C{=}N$, NC, NO_2, $(R^Z)C(O)O$, $(R^Z)OC(O)$, $(R^Z)C(O)N(R^Z)$, or $(R^Z)_2NC(O)$, or two of the R^S are taken together to form an unsubstituted (C_1-C_{18})alkylene, wherein each R^Z independently is an unsubstituted (C_1-C_{18})alkyl.

4. The olefin polymerization catalyst system according to claim 3, wherein R^a, R^e, R^f and R^j are each independently selected from the group consisting of halogen atoms, (C_1-C_8)alkyl groups, and (C_1-C_8)alkoxyl groups.

5. The olefin polymerization catalyst system according to claims 3 or 4, wherein R^a, R^e, R^f and R^j are each independently methyl, ethyl, or isopropyl.

6. The olefin polymerization catalyst system of claim 1, wherein said metal-ligand complex of Formula (I) is selected from the group consisting of Procatalysts 1–16:



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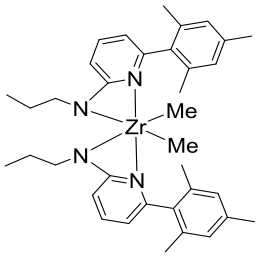

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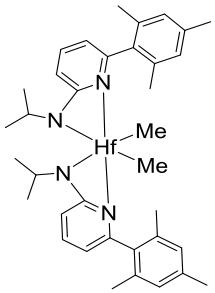

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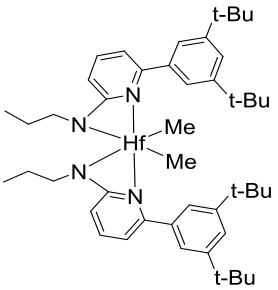

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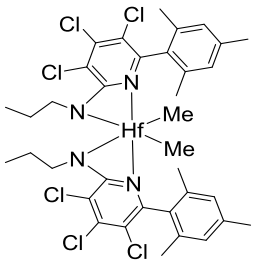

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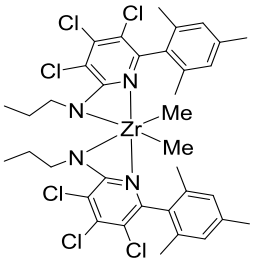

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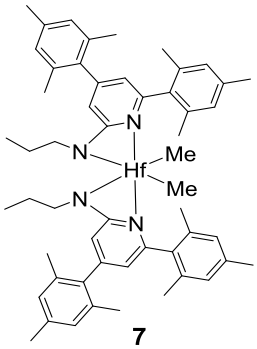

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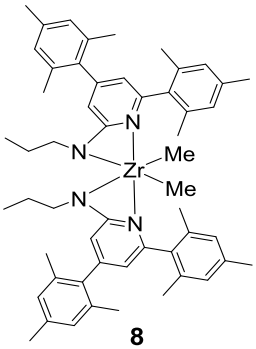

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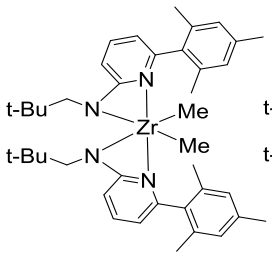

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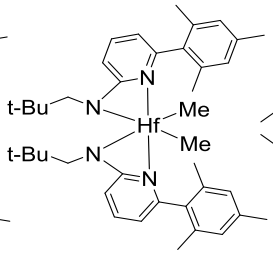

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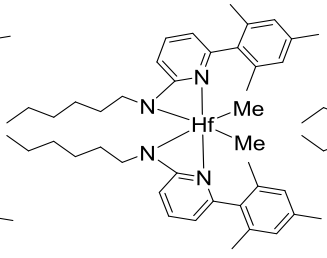

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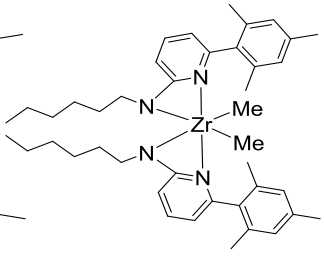

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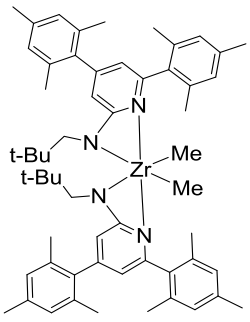

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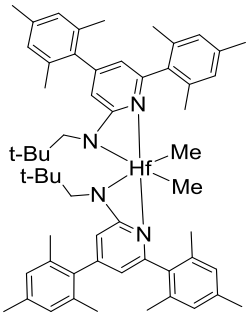

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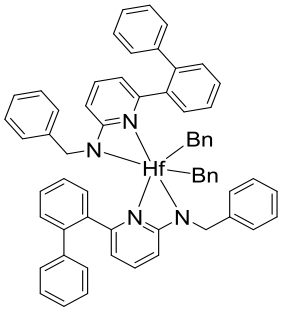

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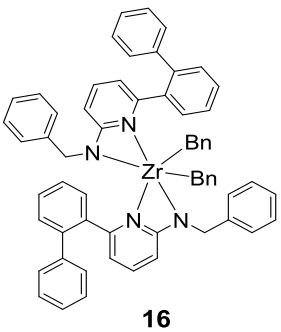

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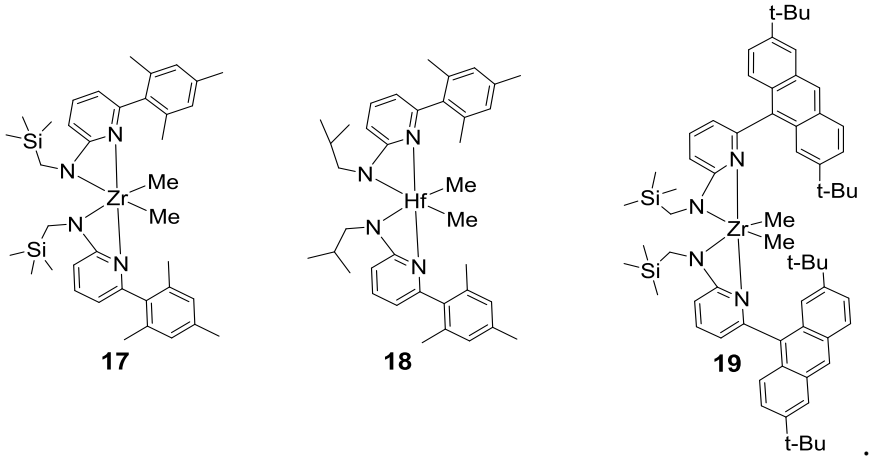
7. The olefin polymerization catalyst system of claim 6, wherein said metal-ligand complex of Formula (I) is selected from the group consisting of Procatalyst 1, Procatalyst 7, Procatalyst 8, Procatalyst 10, Procatalyst 11, and Procatalyst 14.

8. The olefin polymerization catalyst system of claim 6, wherein said metal-ligand complex of Formula (I) is selected from the group consisting of Procatalyst 1, Procatalyst 7, and Procatalyst 8.

9. The olefin polymerization catalyst system of claim 1, wherein said metal-ligand complex of Formula (I) is selected from the group consisting of Procatalyst 17, Procatalyst 18, and Procatalyst 19:



10. The olefin polymerization catalyst system of claim 1, wherein the term "$[(Si)_1$-$(C+Si)_{40}]$ substituted organosilyl" refers to a substituted silyl radical with 1 to 40 silicon atoms and 0 to 39 carbon atoms, such that the total number of carbon plus silicon atoms is 1 to 40.

11. The olefin polymerization catalyst system of claim 1, wherein each R^5 and R^6 independently is a $[(Si)_1$-$(C+Si)_{40}]$ substituted organosilyl, wherein the $[(Si)_1$-$(C+Si)_{40}]$ substituted organosilyl is selected from the group consisting of trimethylsilyl, triisopropylsilyl dimethylphenylsilyl, diphenylmethylsilyl, triphenylsilyl, and triethylsilyl.

12. A process for polymerizing one or more olefin-based polymers comprising:

polymerizing one or more olefin monomers in the presence of an olefin polymerization catalyst system according to any one of claims 1 to 9.

13. The process according to claim 12, wherein the olefin polymerization catalyst system further comprises an activator.

14. The process according to claim 12 or 13, wherein the olefin polymerization catalyst system further comprises a chain transfer agent.