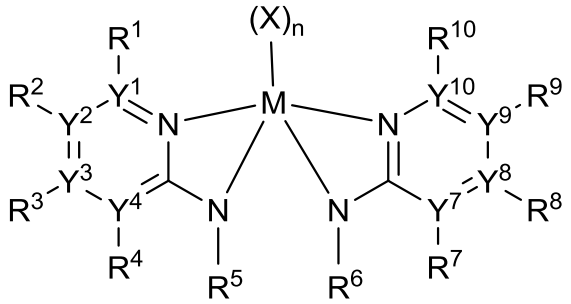
CLAIMS

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



(I)

where:

M is titanium, zirconium, or hafnium;

each X is independently a monodentate or polydentate ligand that is neutral, monoanionic, or dianionic;

n is an integer;

the metal-ligand complex of Formula (I) is overall charge-neutral;

each of $Y^{1–4}$ is independently selected from C or N with the proviso that exactly one of $Y^{1–4}$ is N or exactly two of $Y^{1–4}$ are N;

each of $Y^{7–10}$ is independently selected from C or N with the proviso that exactly one of $Y^{7–10}$ is N or exactly two of $Y^{7–10}$ are N;

R^1 and R^{10} are both independently selected from the group consisting of (C_1-C_{40}) hydrocarbyl, substituted (C_1-C_{40}) hydrocarbyl, (C_1-C_{40}) heterohydrocarbyl, substituted (C_1-C_{40}) heterohydrocarbyl, and an electron pair;

each of R^2, R^3, R^4, R^7, R^8, and R^9 is independently selected from the 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, nitro, and an electron pair; and

R^5 and R^6 are both independently selected from the group consisting of (C_1-C_{40}) hydrocarbyl, substituted (C_1-C_{40}) hydrocarbyl, (C_1-C_{40}) heterohydrocarbyl, and substituted (C_1-C_{40}) heterohydrocarbyl;

any two or more of R^{1-5} optionally may be taken together to form at least one ring structure having from 5 to 16 atoms in the ring excluding any hydrogen atoms;

any two or more of R^{6-10} optionally may be taken together to form at least one ring structure having from 5 to 16 atoms in the ring excluding any hydrogen atoms; and

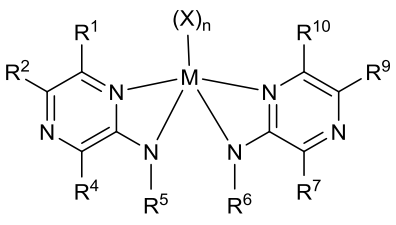
any two or more of R^{1-10} optionally may be taken together to form a linked tetradentate chelant structure.

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

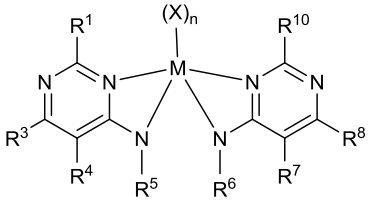
3. The olefin polymerization catalyst system of claim 1 or 2, wherein R^5 and R^6 are each independently (C_1-C_{40}) primary or secondary alkyl groups or substituted primary or secondary alkyl groups.

4. The olefin polymerization catalyst system of any one of the preceding claims, wherein R^1 and R^{10} are aryl, substituted aryl, heteroaryl, or substituted heteroaryl groups.

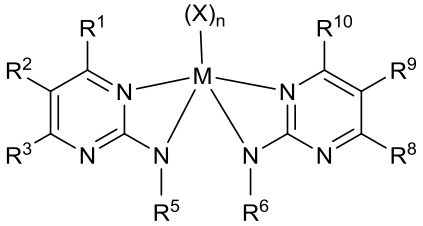
5. The olefin polymerization catalyst system of any one of the preceding claims, wherein the metal-ligand complex of Formula (I) is selected from the group consisting of complexes according to Formula (I.a), complexes according to Formula (I.b), complexes according to Formula (I.c), complexes according to Formula (I.d), complexes according to Formula (I.e), and complexes according to Formula (I.f):



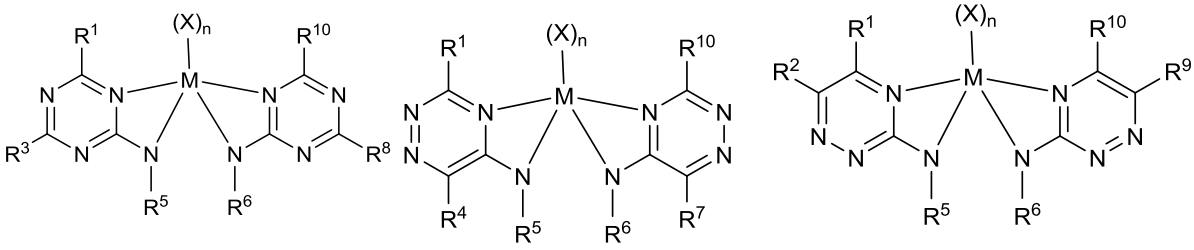
(I.a)



(I.b)



(I.c)



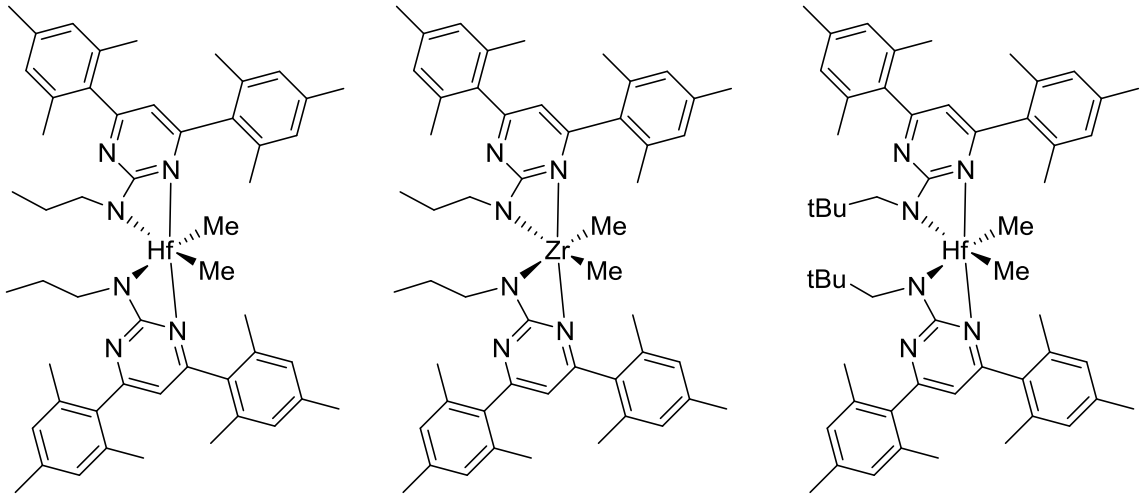
(I.d) (I.e) (I.f)

where each of $R^{1–10}$, M, X, and n are as defined in Formula (I).

6. The olefin polymerization catalyst system of claim 5, wherein said metal-ligand complex of Formula (I) is selected from the group consisting of complexes according to Formula (I.a), complexes according to Formula (I.b), complexes according to Formula (I.c), and complexes according to Formula (I.d).

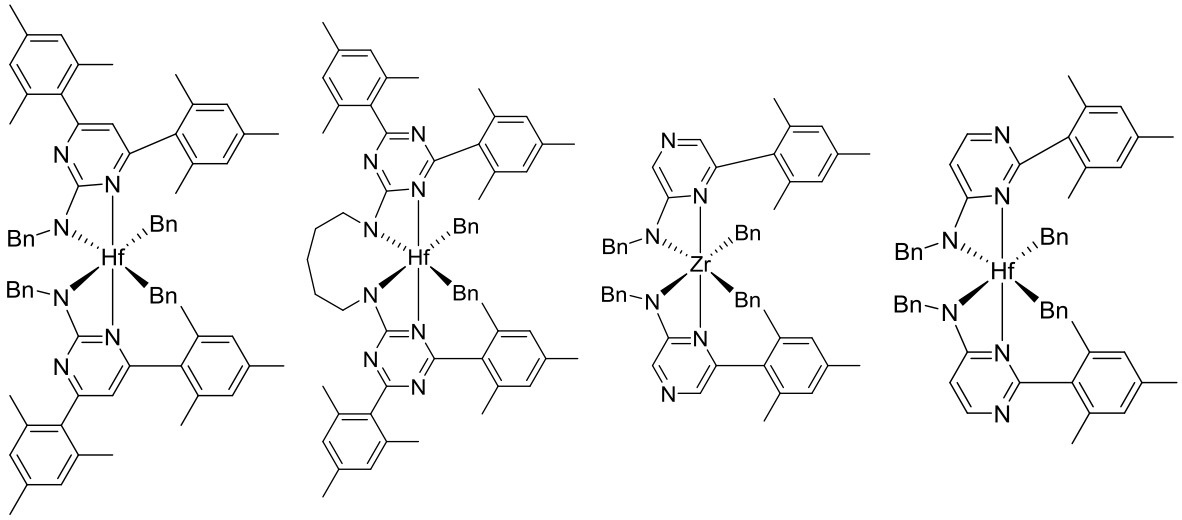
7. The olefin polymerization catalyst system of claim 5, wherein said metal-ligand complex of Formula (I) is a complex according to Formula (I.c).

8. The olefin polymerization catalyst system according to claim 1, wherein said metal-ligand complex of Formula (I) is selected from the group consisting of Procatalysts 1–3:



Procatalyst 1 Procatalyst 2 Procatalyst 3

9. The olefin polymerization catalyst system according to claim 1, wherein said metal-ligand complex of Formula (I) is selected from the group consisting of Procatalysts 4–7:



Procatalyst 4 Procatalyst 5 Procatalyst 6 Procatalyst 7

10. The olefin polymerization catalyst system according to any one of claims 1–7, wherein M is zirconium or hafnium.

11. A process for polymerizing one or more olefin-based polymers, the process comprising:

polymerizing one or more olefin monomers in the presence of an olefin polymerization catalyst system according to any one of claims 1-10.

12. The process according to claim 11, wherein the olefin polymerization catalyst system further comprises an activator and, optionally, a chain transfer agent.