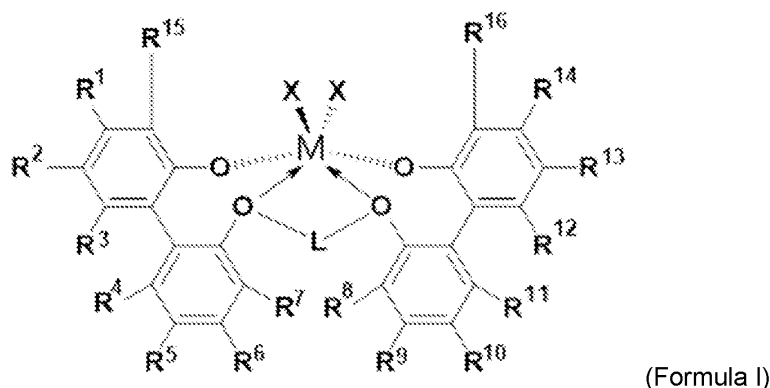


What is claimed is:

1. A use of a supported gas-phase biphenylphenol polymerization catalyst to make a polymer via a gas-phase polymerization process, wherein the supported gas-phase biphenylphenol polymerization catalyst is made from a gas-phase biphenylphenol polymerization precatalyst of Formula I:



wherein each of R^5 , R^7 , R^8 , and R^{10} is independently is a (C_1 to C_{20})alkyl, aryl, aralkyl, halogen, or a hydrogen;

wherein each of R^4 and R^{11} independently is a halogen or a hydrogen;

wherein each of R^2 and R^{13} independently is a (C_1 to C_{20})alkyl, aryl or aralkyl or a hydrogen;

wherein each of R^{15} and R^{16} independently is a 2,7-disubstituted carbazol-9-yl or a 3,6-disubstituted carbazol-9-yl;

wherein L is a linear C_3 or C_4 alkylene that forms a 3-carbon bridge or 4-carbon bridge, respectively, between the two oxygen atoms to which L is covalently bonded;

wherein each of R^1 , R^3 , R^{12} , and R^{14} independently is a (C_1 - C_8)alkyl, halogen, or a hydrogen;

wherein each of R^6 and R^9 is a hydrogen or (C_1 - C_8)alkyl;

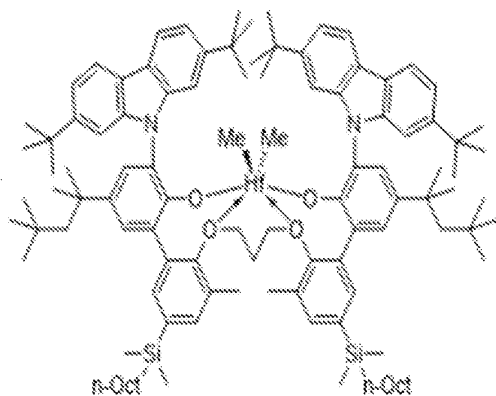
wherein each X independently is a halogen, a hydrogen, a (C_1 - C_{20})alkyl, a (C_7 - C_{20})aralkyl, a (C_1 - C_6)alkyl-substituted (C_6 - C_{12})aryl, or a (C_1 - C_6)alkyl-substituted benzyl, $-\text{CH}_2\text{Si}(\text{R}^c)_3$, where R^c is (C_1 - C_{12})hydrocarbon; and

wherein M is Zr or Hf.

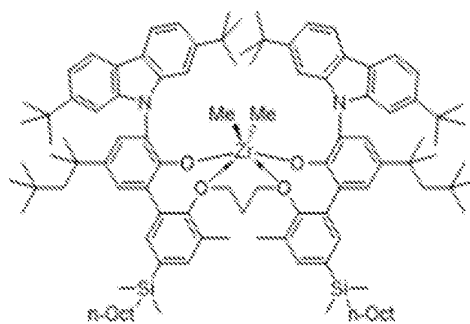
2. The use of claim 1, wherein each X is a methyl.

3. The use of claim 1 or 2, wherein each of R^1 , R^3 , R^{12} , and R^{14} is a hydrogen.

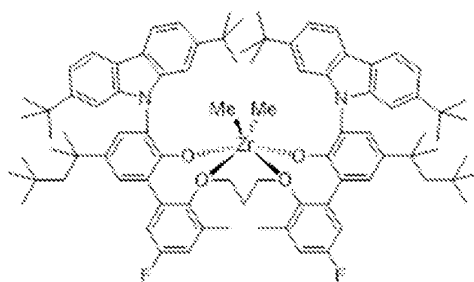
4. The use of claim 1, 2 or 3, wherein the gas-phase biphenylphenol polymerization precatalyst of Formula I is selected from a group consisting of the structures of (i), (ii), (iii), (iv), (v), (vi), (vii), (viii) and (ix)



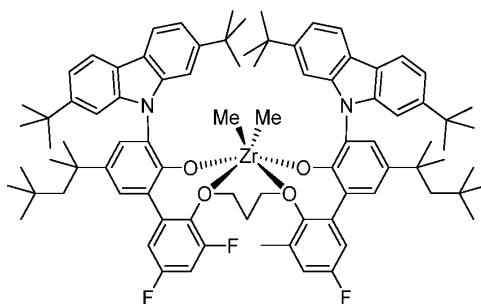
(i);



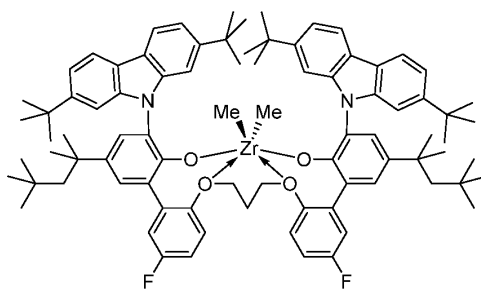
(ii);



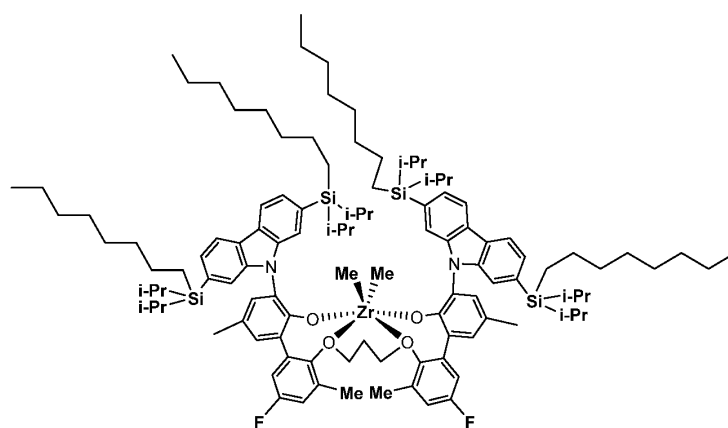
(iii);



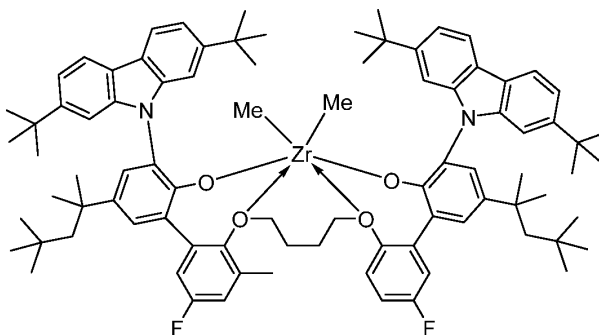
(iv);



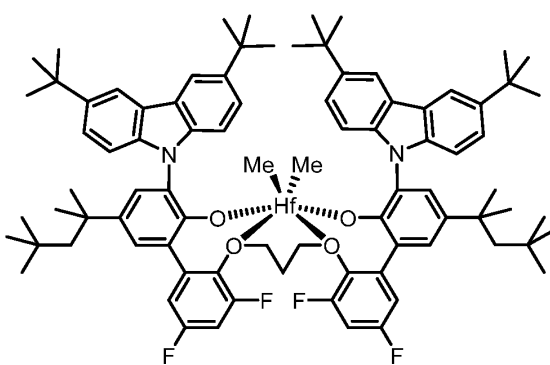
(v);



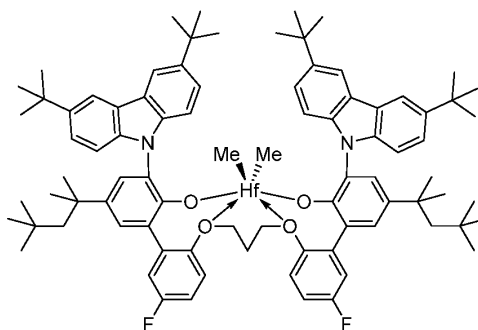
(vi);



(vii);

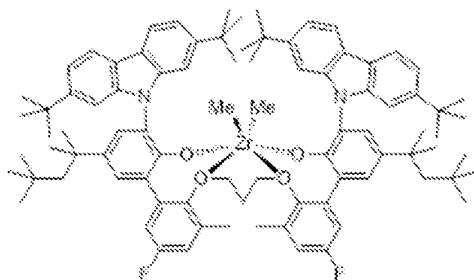


(viii); and

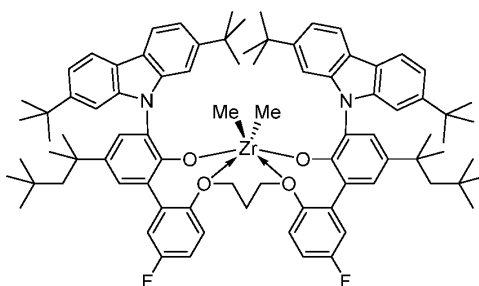


(ix).

5. The use of claim 1, 2 or 3, wherein the gas-phase biphenylphenol polymerization precatalyst is selected from a group consisting of the structures of (iii) and (v).



(iii); and



(v).

6. The use of claim 1, wherein the polymer formed at B-conditions ($H_2/C_2 = 0.0017$ and $C_6/C_2 = 0.004$ at $100\text{ }^\circ\text{C}$ and 230 pounds per square inch (psi) ethylene) has a molecular weight (Mw) in a range of from about 150,000 Daltons to about 1,200,000 Daltons; or wherein the polymer formed at K-conditions ($H_2/C_2 = 0.0068$ and $C_6/C_2 = 0.004$ at $100\text{ }^\circ\text{C}$ and 230 psi) has Mw of less than about 500,000 Daltons.

7. A gas-phase polymerization catalyst system to make a polymer via a gas-phase polymerization process, the gas-phase polymerization catalyst comprising:
 a metallocene olefin polymerization catalyst; and
 the supported gas-phase biphenylphenol polymerization catalyst made from the gas-phase biphenylphenol polymerization precatalyst of claim 1.

8. A gas-phase polymerization method to make a polymer, the method comprising:
 polymerizing an olefin monomer in a gas-phase polymerization reactor in presence of the gas-phase polymerization catalyst system of claim 7 to make the polymer.

9. The gas-phase polymerization catalyst system of claim 7 or the gas-phase polymerization method of claim 8, wherein each of R¹⁵ and R¹⁶ is a 3,6-di-t-butylcarbazol-9-yl.

10. A polyethylene composition comprising a high molecular weight polyethylene component and a low molecular weight polyethylene component, wherein the high and low molecular weight polyethylene components are made together in a single gas-phase reactor via a polymerization process employing the gas-phase polymerization catalyst system of claim 7.