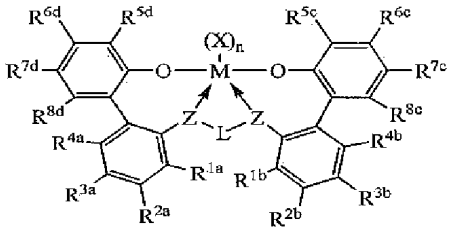
CLAIMS:

1. A process for preparing an olefin homopolymer or copolymer, comprising contacting ethylene, an alpha-olefin, or a combination thereof, and a catalytic amount of a metal-ligand complex catalyst of the formula



wherein M is titanium, zirconium, or hafnium, each independently being in a formal oxidation state of +2, +3, or +4;

n is an integer of from 0 to 3, wherein when n is 0, X is absent;

each X is independently a monodentate ligand that is neutral, monoanionic, or dianionic, or two X are taken together to form a bidentate ligand that is neutral, monoanionic, or dianionic;

X and n are selected such that the metal-ligand complex is neutral;

each Z moiety independently is O, S, N(C_1-C_{40}) hydrocarbyl, or P(C_1-C_{40}) hydrocarbyl;

L is (C_1-C_{40})hydrocarbylene or (C_1-C_{40})heterohydrocarbylene, provided such has a portion that comprises a 2- to 8-carbon atom linker backbone linking the Z moieties, each atom of such 2- to 8-atom linker being independently a carbon atom or a heteroatom, wherein each heteroatom independently is O, S, S(O), $S(O)_2$, $Si(R^C)_2$, $Ge(R^C)_2$, $P(R^P)$, or $N(R^N)$, wherein independently each R^C is unsubstituted (C_1-C_{18})hydrocarbyl or the two R^C are taken together to form a (C_2-C_{19})alkylene, each R^P is unsubstituted (C_1-C_{18})hydrocarbyl; and each R^N is unsubstituted (C_1-C_{18})hydrocarbyl, a hydrogen or absent;

R^{1a}, R^{1b}, or both is a halogen atom;

R^{2a}, R^{3a}, R^{4a}, R^{2b}, R^{3b}, R^{4b}, R^{6c}, R^{7c}, R^{8c}, R^{6d}, R^{7d}, and R^{8d} independently is a hydrogen atom; (C_1-C_{40})hydrocarbyl; (C_1-C_{40})heterohydrocarbyl; $Si(R^C)_3$, $Ge(R^C)_3$, $P(R^P)_2$, $N(R^N)_2$, OR^C, SR^C, NO_2, CN, F_3C, F_3CO, RCS(O)-, $RCS(O)_2$-, $(RC)_2C$=N-, RCC(O)O-, RCOC(O)-, RCC(O)N(R)-, $(RC)_2NC(O)$- or halogen atom; and R^{5c} and R^{5d} is independently

selected from 1,2,3,4-tetrahydronaphthyl; anthracenyl; 1,2,3,4-tetrahydroanthracenyl; 1,2,3,4,5,6,7,8-octahydroanthracenyl; phenanthrenyl; 1,2,3,4,5,6,7,8-octahydrophenanthrenyl; 2,6-dimethylphenyl; 2,6-diisopropylphenyl; 3,5-di(tertiary-butyl)phenyl; 3,5-diphenylphenyl; 1-naphthyl; 2-methyl-1-naphthyl; 2-naphthyl; 1,2,3,4-tetra-hydronaphth-5-yl; 1,2,3,4-tetrahydronaphth-6-yl; anthracen-9-yl; 1,2,3,4-tetrahydroanthracen-9-yl; 1,2,3,4,5,6,7,8-octahydroanthracen-9-yl; 1,2,3,4,5,6,7,8-octahydrophenanthren-9-yl; indolyl; indolinyl; quinolinyl; 1,2,3,4-tetrahydroquinolinyl; isoquinolinyl; 1,2,3,4-tetrahydroisoquinolinyl; carbazolyl; 1,2,3,4-tetrahydrocarbazolyl; 1,2,3,4,5,6,7,8-octahydrocarbazolyl; 2,7-di(tertiary-butyl)-carbazol-9-yl; 2,7-di(tertiary-octyl)-carbazol-9-yl; 2,7-diphenylcarbazol-9-yl; and 2,7-bis(2,4,6-trimethylphenyl)-carbazol-9-yl;

under conditions such that an ethylene homopolymer, an alpha-olefin homopolymer, or an ethylene/alpha-olefin copolymer is formed,

such having a weight average molecular weight that is reduced by at least 20 percent when compared with an otherwise identical ethylene homopolymer, alpha-olefin homopolymer or ethylene/alpha-olefin copolymer prepared under identical conditions with a catalyst that is otherwise identical but wherein neither R^{1a} nor R^{1b} is a halogen atom.

2. The process of claim 1 wherein R^{1a}, R^{1b}, or both is a halogen atom selected from fluorine, chlorine, iodine, or combinations thereof.

3. The process of claim 1 wherein the alpha-olefin is selected from the group consisting of linear alpha-olefins having from 3 to 12 carbons, branched alpha-olefins having from 5 to 16 carbons, and combinations thereof.