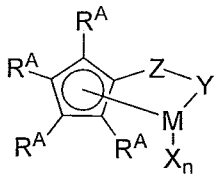
We Claim:

1. A process for producing a polyolefin comprising contacting one or more olefinic monomers in at least one reactor in the presence of one or more catalysts and in the absence of an activation agent, wherein one or more of the catalysts has the following structure:




wherein M is a Group III or Lanthanide metal that is in a +3 formal oxidation state;

each $R^A$ independently is selected from the group consisting of $(C_1\text{-}C_{40})$hydrocarbyl; $(C_1\text{-}C_{40})$heterohydrocarbyl; $Si(R^B)_3$; halogen atom; hydrogen atom; and any combination thereof;

optionally two or more $R^A$ groups can combine together into one or more ring structures, with such ring structures having from 3 to 50 atoms in each ring structure excluding any hydrogen atoms;

Z is $[(R^D)_nG]_m$, wherein m is 1, 2 ,3, or 4, and G is independently selected from carbon, silicon, germanium or boron; and when G is carbon, silicon, or germanium, n is 2; when G is boron, n is 1;

Y is bonded to M and Z and is selected from the group consisting of -O-, -S-, $-NR^E$-, and $-PR^E$-;

each $R^B$, $R^D$, or $R^E$ independently is $(C_1\text{-}C_{30})$hydrocarbyl or $(C_1\text{-}C_{30})$heterohydrocarbyl;

each X is independently monoanionic or neutral wherein n is greater than 0, and each X is independently $(C_1\text{-}C_{40})$hydrocarbon, $(C_1\text{-}C_{40})$heterohydrocarbon, $(C_1\text{-}C_{40})$hydrocarbyl; $(C_1\text{-}C_{40})$heterohydrocarbyl; $Si(R^C)_3$; halogen atom; or hydrogen atom;

each $R^C$ independently is $(C_1\text{-}C_{30})$hydrocarbyl or $(C_1\text{-}C_{30})$heterohydrocarbyl;

each of the hydrocarbyl, heterohydrocarbyl, $Si(R^C)_3$,

hydrocarbylene, and heterohydrocarbylene groups independently is unsubstituted or substituted with one or more $R^S$ substituents;

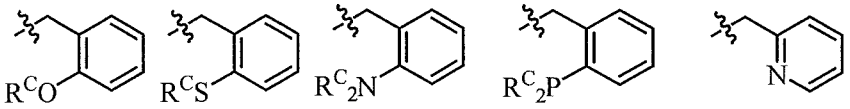
each $R^S$ independently is a halogen atom; polyfluoro substitution; perfluoro substitution; unsubstituted ($C_1$-$C_{18}$)alkyl; or two of the $R^S$ are taken together to form an unsubstituted ($C_1$-$C_{18}$)alkylene, wherein each R independently is an unsubstituted ($C_1$-$C_{18}$)alkyl;

$R^c$ or $R^S$ optionally have an additional interaction with M.

2. The process according to claim 1, wherein X is ($C_1$-$C_{40}$)hydrocarbyl, ($C_1$-$C_{40}$)heterohydrocarbyl, $Si(R^C)_3$, or a hydrido group.

3. The process according to claim 1, wherein X is a substituted benzyl or substituted heteroarylbenzyl.

4. The process according to claim 3 wherein X is selected from the group consisting of

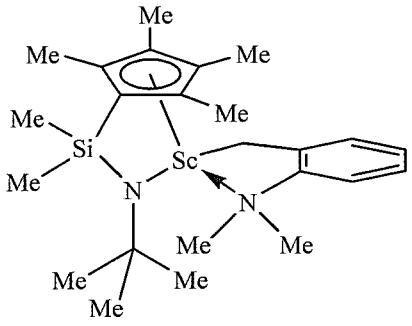



5. The process according to claim 1, wherein the one or more olefinic monomers comprises ethylene.

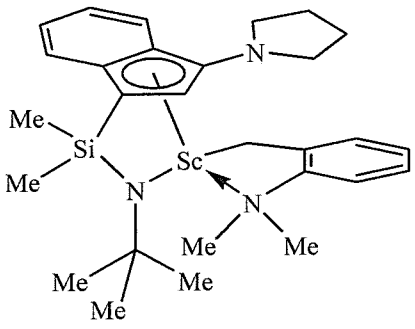
6. The process according to claim 1, wherein the one or more olefinic monomers is a α-olefin.

7. The process according to claim 1, wherein one of the one or more olefinic monomers is a diene.

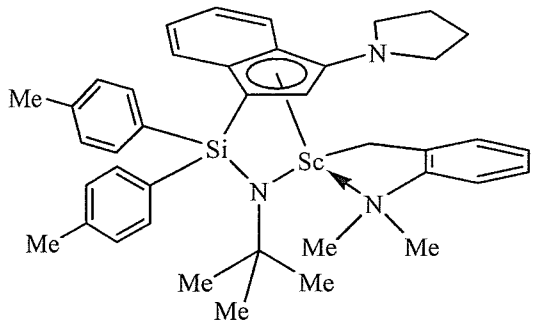
8. The process according to claim 1, wherein the one or more catalysts comprises one or more of the following:




;




; and




9. The process according to claim 1, wherein the process is conducted in one or more polymerization process selected from the group consisting of solution phase polymerization process, gas phase polymerization process, and slurry phase polymerization.

10. The process according to claim 1, wherein the process is conducted in more than one reactor connected in series or parallel.