Claims:

1. A process for preparing a silyl-terminated polyolefin comprising:

1) combining starting materials comprising

A) a polymeryl-zinc;

B) a nitrogen containing heterocycle, and

C) a halosilane;

thereby forming a product comprising the silyl-terminated polyolefin.

2. The process of claim 1, further comprising: forming the polymeryl-metal before step 1) by a process comprising combining starting materials comprising

i) an olefin monomer,

ii) a catalyst, and

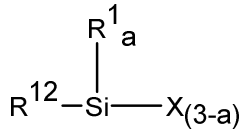
iii) a chain shuttling agent of formula R_2Zn, where each R is independently a monovalent hydrocarbyl group of 2 to 12 carbon atoms.

3. The process of claim 2, where the starting materials further comprise one or more additional materials selected from: iv) a solvent, vi) a scavenger, vii) an adjuvant, and viii) a polymerization aid.

4. The process of any one of claims 1 to 3, further comprising purifying A) the polymeryl-zinc before step 1).

5. The process of any one of the preceding claims, where A) the polymeryl-zinc comprises A1) di-polyethylene zinc, A2) polyethylene/octene zinc, and a mixture of A1) and A2).

6. The process of claim 5, where the silyl terminated polyolefin has formula:



, where R^{12} is hydrogen-terminated polyethylene, each R^1 is independently selected from hydrogen and a monovalent hydrocarbyl group of 1 to 18 carbon atoms, each X is a halogen atom, and subscript a is 1 to 3.

7. A process for preparing a hydrocarbyl functional silane comprising:

1) combining starting materials comprising

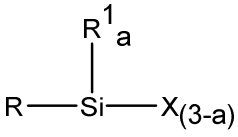
A) a chain shuttling agent of formula R_2Zn, where each R is independently a monovalent hydrocarbyl group of 2 to 12 carbon atoms;

B) a nitrogen containing heterocycle, and

C) a halosilane;

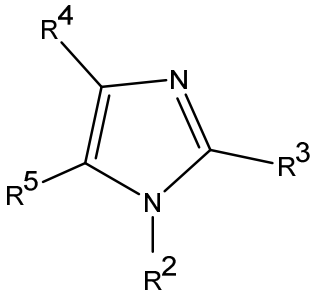
thereby forming a product comprising the hydrocarbyl functional silane.

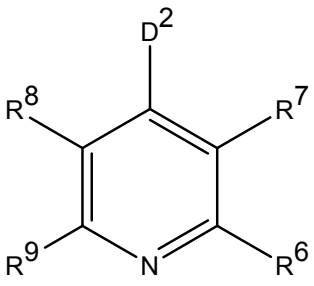
8. The process of claim 7, where the hydrocarbyl functional silane has formula:

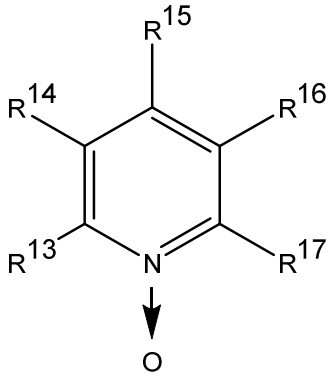


, where each R is independently a monovalent hydrocarbyl group of 2 to 12 carbon atoms, each R^1 is independently selected from hydrogen and a monovalent hydrocarbyl group of 1 to 18 carbon atoms, each X is a halogen atom, and subscript a is 1 to 3.

9. The process of any one of the preceding claims, where B) the nitrogen containing heterocycle has a general formula selected from:

B1) 

, B2) 

, B3) 

, or two or more of B1), B2) and B3), where R^2 is a monovalent hydrocarbyl group, R^3 is a hydrogen atom or a monovalent hydrocarbyl group, R^4 is a hydrogen atom or a monovalent hydrocarbyl group, R^5 is a hydrogen atom or a monovalent hydrocarbyl group, R^6 is a hydrogen atom or a monovalent hydrocarbyl group, R^7 is a hydrogen atom or a monovalent hydrocarbyl group, R^8 is a hydrogen atom or a monovalent hydrocarbyl group, R^9 is a hydrogen atom or a monovalent hydrocarbyl group, and D^2 is an amino functional hydrocarbyl group or group of formula $–NR^{11}_2$, where each R^{11} is a monovalent hydrocarbyl group, R^{13} is a hydrogen atom or a monovalent hydrocarbyl group, R^{14} is a hydrogen atom or a monovalent hydrocarbyl

group, R^{15} is a hydrogen atom or a monovalent hydrocarbyl group, R^{16} is a hydrogen atom or a monovalent hydrocarbyl group, and R^{17} is a hydrogen atom or a monovalent hydrocarbyl group.

10. The process of any one of the preceding claims, where C) the halosilane has formula $R^1_aSiX_{(4-a)}$, where each R^1 is independently selected from hydrogen and a monovalent hydrocarbyl group of 1 to 18 carbon atoms, each X is a halogen atom, and subscript a is 1 to 3.