[0008a] In one aspect, there is provided a method of forming a catalyst composition while substantially normalizing stereochemical configuration, comprising:

slurrying a metallocene compound in dimethoxyethane (DME);

adding a solution of RMgBr in DME, wherein R is a methyl group or a benzyl group, and wherein the RMgBr is greater than about 2.3 equivalents relative to the metallocene compound;

mixing for at least about four hours to form an alkylated metallocene compound; and

isolating the alkylated metallocene, wherein the alkylated species has a ratio of meso / rac enantiomers that is between about 0.9 and about 1.2.

[0009] Another exemplary embodiment described herein provides a method of alkylating an organometallic compound while substantially normalizing stereochemical configuration. The method includes slurrying the organometallic compound in ether, and adding a solution of RLi in ether, wherein R is a methyl group or a benzyl group, and wherein the RMgBr is greater than about 2.3 equivalents relative to the organometallic compound. After the addition of the RMgBr, the slurry is mixed for at least about four hours. An alkylated organometallic is isolated, wherein the methylated species has a meso / rac ratio that is between about 0.9 and about 1.2.

[0009a] In another aspect, there is provided a method of alkylating an metallocene compound while substantially normalizing stereochemical configuration, comprising:

slurrying the metallocene compound in ether;

adding a solution of RLi in ether, wherein R is a methyl group or a benzyl group, and wherein the RLi is greater than about 2.3 equivalents relative to the metallocene compound;

mixing for at least about four hours to form an alkylated metallocene compound; and

isolating the alkylated metallocene, wherein the alkylated species has a meso / rac ratio that is between about 0.9 and about 1.2.

[0010] Another exemplary embodiment provides a catalyst composition including a first catalyst compound and a second catalyst compound that are co-supported forming a commonly supported catalyst system, wherein the first catalyst compound includes the following formula:

$$(C_5H_aR^1{}_b)(C_5H_cR^2{}_d)HfX_2$$

Each R^1 is independently H, a hydrocarbyl group, a substituted hydrocarbyl group, or a heteroatom group. Each R^2 is independently H, a hydrocarbyl group, a substituted hydrocarbyl

CLAIMS

What is claimed is:

1. A method of forming a catalyst composition while substantially normalizing stereochemical configuration, comprising:

slurrying a metallocene compound in dimethoxyethane (DME);

adding a solution of RMgBr in DME, wherein R is a methyl group or a benzyl group, and wherein the RMgBr is greater than about 2.3 equivalents relative to the metallocene compound;

mixing for at least about four hours to form an alkylated metallocene compound; and

isolating the alkylated metallocene, wherein the alkylated species has a ratio of meso / rac enantiomers that is between about 0.9 and about 1.2.

2. The method of claim 1, comprising:

dissolving 1-ethylindenyllithium in dimethoxyethane to form a precursor solution;

cooling the precursor solution to about -20 °C;

adding solid $ZrCl_4$ over about five minutes to start a reaction;

continuing the reaction overnight;

removing volatiles to form a raw product;

extracting the raw product with CH_2Cl_2; and

removing the CH_2Cl_2 under vacuum to form the metallocene compound.

3. The method of claim 1, comprising:

fluidizing a catalyst support with an inert gas;

heating the support to remove any adsorbed water forming a dried support; and

storing the dried support under an inert gas.

4. The method of claim 3, comprising:

forming a slurry of the dried support in a mixture of toluene and methylaluminoxane; and

drying the mixture to form methyl amluminoxane supported on silica (SMAO).

5. The method of claim 4, comprising:

adding pentane to the SMAO to form a slurry;

dissolving the alkylated metallocene component in toluene to form a toluene solution;

adding the toluene solution to the slurry to form a catalyst;

filtering the catalyst from the slurry; and

drying the catalyst.

6. A method of alkylating an metallocene compound while substantially normalizing stereochemical configuration, comprising:

slurrying the metallocene compound in ether;

adding a solution of RLi in ether, wherein R is a methyl group or a benzyl group, and wherein the RLi is greater than about 2.3 equivalents relative to the metallocene compound;

mixing for at least about four hours to form an alkylated metallocene compound; and

isolating the alkylated metallocene, wherein the alkylated species has a meso / rac ratio that is between about 0.9 and about 1.2.