

CLAIMS

What is claimed is:

1. A catalyst system, comprising:
a catalyst compound;
a support comprising a fluorinated support, wherein the fluorinated support is generated by heating a mixture of a catalyst support that can be fluorinated and a fluoride donor compound in a fluidized bed reactor that is fluidized by maintaining a flow rate of a fluidizing gas of about 0.1 ft. / sec at less than about 370 °C and greater than about 0.35 ft./ sec at temperatures greater than about 370 °C; and
an aluminoxane, wherein the aluminoxane is present in an amount of about 10 mmol or less per gram of the support.
2. The catalyst system of claim 1, wherein a ratio of a pressure drop across a distributor plate to a pressure drop across the fluidized bed is maintained at greater than about 7 %.
3. The catalyst system of claim 1, wherein a flow rate of the fluidizing gas is increased from about 0.1 ft. / sec. to about 0.4 ft./ sec starting at a temperature of between about 350 °C and about 370 °C.
4. The catalyst system of claim 1, wherein the support is generated in a fluidized bed reactor with a height to depth ratio of a fluidized bed of at least about 2.3.
5. The catalyst system of claim 1, wherein the support has a fluoride concentration ranging from about 1 wt. % to about 10 wt. %, based on a weight of the support and an aluminum concentration ranging from about 3 wt. % to about 40 wt. % based on the weight of the support.
6. The catalyst system of claim 1, wherein the support has a fluoride concentration ranging from about 4 wt. % to about 8 wt. %, based on a weight of the support and an aluminum concentration ranging from about 20 wt. % to about 40 wt. % based on the weight of the support.
7. The catalyst system of claim 1, wherein the support has a fluoride concentration ranging from about 2 wt. % to about 4 wt. %, based on a weight of the support and an aluminum concentration ranging from about 3 wt. % to about 10 wt. % based on the weight of the support.

8. The catalyst system according to claim 1, wherein the concentration on metal from the catalyst compound ranges from about 0.2 wt. % to about 1.3 wt. %, based on a total weight of the catalyst system.
9. The catalyst system according to claim 1, wherein the aluminoxane is present in an amount of about 4 mmol or less per gram of the support.
10. The catalyst system according to claim 1, wherein the aluminoxane is present in an amount of about 2.7 mmol or less per gram of the support.
11. The catalyst system according to claim 1, wherein the aluminoxane comprises methylaluminoxane, modified methylaluminoxane, or a combination thereof.
12. The catalyst system according to claim 1, wherein the support further comprises silica.
13. The catalyst system according to claim 1, wherein the catalyst compound comprises a metallocene catalyst.
14. The catalyst system of claim 13, wherein the metallocene catalyst has the formula:

$$\text{Cp}^{\text{A}}\text{Cp}^{\text{B}}\text{MX}_n \text{ or } \text{Cp}^{\text{A}}(\text{A})\text{Cp}^{\text{B}}\text{MX}_n,$$

wherein M is a Group 4, 5 or 6 atom; Cp^{A} and Cp^{B} are each bound to M and are independently selected from the group consisting of cyclopentadienyl ligands, substituted cyclopentadienyl ligands, ligands isolobal to cyclopentadienyl and substituted ligands isolobal to cyclopentadienyl; (A) is a divalent bridging group bound to both Cp^{A} and Cp^{B} selected from the group consisting of divalent C_1 to C_{20} hydrocarbyls and C_1 to C_{20} heteroatom containing hydrocarbonyls, wherein the heteroatom containing hydrocarbonyls comprise from one to three heteroatoms; X is a leaving group selected from the group consisting of chloride ions, bromide ions, C_1 to C_{10} alkyls, and C_2 to C_{12} alkenyls, carboxylates, acetylacetonates, and alkoxides; and n is an integer from 1 to 4.