**[0004a]** In another aspect, there is provided a method for forming a catalyst system comprising:

forming a mixture of a support material that can be fluorinated and a fluoride donor;

adding the mixture to a fluidized bed reactor;

fluidizing the mixture in the fluidized bed reactor with a fluidizing gas by maintaining a flow rate of the fluidizing gas of 0.1 ft. / sec at less than 370°C and greater than 0.35 ft./ sec at temperatures greater than 370°C;

calcining the mixture to decompose the fluoride donor, forming the fluorinated catalyst support;

and either:

combining a catalyst compound with the fluorinated catalyst support, and an aluminoxane, wherein the aluminoxane is present in an amount of 10 mmol or less per gram of the catalyst support; or

combining a catalyst compound and an aluminoxane to produce a first mixture; and adding the fluorinated catalyst support to the first mixture and drying, to produce the catalyst system.

## DESCRIPTION OF THE DRAWINGS

**[0005]** The advantages of the present techniques are better understood by referring to the following detailed description and the attached drawings, in which:

CLAIMS

*What is claimed is:*

1. A method for making a fluorinated catalyst support, comprising:

forming a mixture of a support material that can be fluorinated and a fluoride donor;

adding the mixture to a fluidized bed reactor;

fluidizing the mixture in the fluidized bed reactor with a fluidizing gas by maintaining a flow rate of the fluidizing gas of 0.1 ft. / sec at less than 370 °C and greater than 0.35 ft./ sec at temperatures greater than 370 °C; and

calcining the mixture to decompose the fluoride donor, forming the fluorinated catalyst support.

2. The method of claim 1, comprising maintaining a ratio of a pressure drop across a distributor plate to a pressure drop across the fluidized bed of greater than 7 %.

3. The method of claim 1, comprising forming a fluidized bed with a height to diameter ratio of at least 2.3.

4. The method of claim 1, comprising increasing a flow rate of the fluidizing gas from 0.1 ft. / sec. to 0.4 ft./ sec starting at a temperature of between 350 °C and 370 °C.

5. The method of claim 1, comprising maintaining a filter face velocity of less than 4 ft./ sec.

6. The method of claim 1, comprising increasing a temperature of the fluidized bed at 30 °C per hour from 230 °C to 370 °C.

7. The method of claim 1, wherein the fluoride donor comprises ammonium hexafluorosilicate, ammonium bifluoride, ammonium tetrafluoroborate, or any combination thereof; or

comprising forming the mixture by impregnating the catalyst support with the fluoride donor by: dissolving the fluoride donor in a solvent; treating the catalyst support with the fluoride donor to form an impregnated catalyst support; and drying the impregnated catalyst support; or

comprising forming the mixture by dry blending the support material with the fluoride donor; or

comprising: adding a portion of the fluoride donor to the support material; calcining to form a partially fluoride support; and repeating the addition and the calcination; or

comprising milling the fluoride donor to form smaller particles.

8. The method of claim 1, wherein the calcining occurs at a temperature of from 200 °C to 1000 °C to produce the support.

9. A method for forming a catalyst system comprising:

forming a mixture of a support material that can be fluorinated and a fluoride donor;

adding the mixture to a fluidized bed reactor;

fluidizing the mixture in the fluidized bed reactor with a fluidizing gas by maintaining a flow rate of the fluidizing gas of 0.1 ft. / sec at less than 370 °C and greater than 0.35 ft./ sec at temperatures greater than 370 °C;

calcining the mixture to decompose the fluoride donor, forming the fluorinated catalyst support;

and either:

combining a catalyst compound with the fluorinated catalyst support, and an aluminoxane, wherein the aluminoxane is present in an amount of 10 mmol or less per gram of the catalyst support; or

combining a catalyst compound and an aluminoxane to produce a first mixture; and adding the fluorinated catalyst support to the first mixture and drying, to produce the catalyst system.