The particles formed are dried in air and activated in an oxygen-containing atmosphere. The activated catalyst intermediate is reduced with an organic aluminum compound.

[010] Durand et al., in U.S. Pat. No. 5,075,395, teach a process for elimination of the induction period in the polymerization of ethylene. The polymerization is conducted with a charge powder in the presence of a catalyst comprising a chromium oxide compound associated with a granular support and activated by thermal treatment, this catalyst being used in the form of a prepolymer. The Durand process is characterized in that the charge powder employed is previously subjected to a treatment by contacting the charge powder with an organoaluminum compound in such a way that the polymerization starts up immediately after the contacting of the ethylene with the charge powder in the presence of the prepolymer.

[011] The above described chromium-based catalysts may be used to produce select grades of polymers. Very often, polymerization reactors are required to produce a broad range of products, having flow indices that may vary from 0.1 dg/min to about 100 dg/min, for example. The flow index response of a chromium-based catalyst refers to the range of the flow index of the polymer made by the catalyst under a given set of polymerization conditions.

SUMMARY

[012] An embodiment relates to a method of preparing a chromium-based catalyst for the polymerization of an olefin into a polyolefin, the method including: contacting a chromium-based catalyst with a reducing agent in a solvent to lower an oxidation state of at least some chromium in the chromium-based catalyst to give a reduced chromium-based catalyst; drying the reduced chromium-based catalyst at a drying line-out temperature; and adjusting the drying line-out temperature to change the flow index response of the reduced chromium-based catalyst.

[012a] In one aspect, there is provided a method of preparing a chromium-based catalyst for the polymerization of an olefin into a polyolefin, the method comprising:

contacting a chromium-based catalyst with a reducing agent in a solvent to lower an oxidation state of at least some chromium in the chromium-based catalyst to give a mixture of a reduced chromium-based catalyst and the solvent, wherein the chromium-based catalyst comprises a chromium oxide catalyst;

drying the reduced chromium-based catalyst at a drying line-out temperature; and

adjusting the drying line-out temperature to change the flow index response of the reduced chromium-based catalyst.

[013] Another embodiment relates to a method of preparing a chromium-based catalyst for the production of polyolefin, the method including: contacting a chromium-based catalyst with a reducing agent in the presence of a solvent in a mix vessel to produce a reduced chromium-based catalyst; evaporating the solvent at a drying temperature to dry the reduced chromium-based catalyst; and specifying the drying temperature to give a desired flow index response of the reduced chromium-based catalyst.

[014] Yet another embodiment relates to a method including preparing a chromium oxide catalyst for the polymerization of an olefin into a polyolefin, the preparing involving:

What is claimed is:

1. A method of preparing a chromium-based catalyst for the polymerization of an olefin into a polyolefin, the method comprising:

contacting a chromium-based catalyst with a reducing agent in a solvent to lower an oxidation state of at least some chromium in the chromium-based catalyst to give a mixture of a reduced chromium-based catalyst and the solvent, wherein the chromium-based catalyst comprises a chromium oxide catalyst;

drying the reduced chromium-based catalyst at a drying line-out temperature; and

adjusting the drying line-out temperature to change the flow index response of the reduced chromium-based catalyst.

2. The method of claim 1, wherein the reducing agent comprises an organoaluminum compound, and wherein the solvent comprises an alkane.

3. The method of claim 1, wherein the reducing agent comprises triethyl aluminum (TEAL).

4. The method of claim 1, wherein the chromium-based catalyst comprises an inorganic oxide support having a pore volume of about 1.1 to about 1.8 cubic centimeters (cm3)/g and a surface area of about 245 to about 375 square meters (m2)/g.

5. The method of claim 1, wherein the chromium-based catalyst comprises an inorganic oxide support having a pore volume of about 2.4 to about 3.7 cm3/g and a surface area of about 410 to about 620 m2/g.