CLAIMS

What is claimed is:

1. A method of operating a polyolefin reactor system, comprising:

feeding a chromium-based catalyst through a mixer to a polymerization reactor;

adding a reducing agent to contact the chromium-based catalyst through the mixer to the polymerization reactor; and

polymerizing an olefin into a polyolefin in the polymerization reactor in presence of the chromium-based catalyst.

2. The method of claim 1, wherein feeding the chromium-based catalyst comprises feeding a slurry of the chromium-based catalyst through the mixer to the polymerization reactor.

3. The method of claim 1, wherein adding the reducing agent comprises adding the reducing agent to the chromium-based catalyst at the mixer or upstream of the mixer, or a combination thereof.

4. The method of claim 1, comprising modulating an addition rate of the reducing agent to the chromium-based catalyst.

5. The method of claim 1, comprising adjusting a feed rate of the reducing agent to the chromium-based catalyst to maintain a specified molar ratio of the reducing agent to the chromium-based catalyst through the mixer to give a desired flow index of the polyolefin.

6. The method of claim 1, wherein adding the reducing agent comprises adjusting an addition rate of the reducing agent to maintain a desired ratio of an addition rate of the reducing agent to a feed rate of the chromium-based catalyst through the mixer.

7. The method of claim 1, comprising adjusting a ratio of a feed rate of the reducing agent to a feed rate of the chromium-based catalyst through the mixer to give a desired flow index of the polyolefin.

8. The method of claim 1, comprising adjusting a molar ratio of the reducing agent to the chromium-based catalyst in response to operating conditions of the polymerization reactor.

9. The method of claim 1, comprising adding a solvent to the chromium-based catalyst through the mixer to the polymerization reactor to maintain or adjust a contact residence time of the chromium-based catalyst and the reducing agent.

10. The method of claim 1, wherein a contact residence time of the chromium-based catalyst and reducing agent in the mixer is in a range of 2 minutes to 120 minutes.

11. The method of claim 1, wherein the mixer comprises an inline mixer.

12. The method of claim 1, comprising adjusting an agitation speed of an agitator of the mixer in response to operating conditions of the polymerization reactor.

13. The method of claim 1, wherein the chromium-based catalyst comprises an inorganic oxide support having a pore volume of about 0.5 to about 6.0 cubic centimeters (cm3)/gram (g) and a surface area of about 200 to about 600 square meters (m2)/g.