CLAIMS

1. A process for producing unimodal ethylene/α-olefin copolymer, the process comprising contacting ethylene and, optionally, one or more (C_3–C_{12})α-olefin comonomers with a catalyst system in a gas-phase polymerization reactor, wherein the catalyst system comprises a chromium-based catalyst;

wherein the unimodal ethylene copolymer comprises:

a density from 0.942 g/cm^3 to 0.950 g/cm^3 according to ASTM D792-13;

a flow index (I_{21}) from 5.5 to 7.5 dg/min, when measured according to ASTM D1238 at 190 °C and a 21.6 kg load;

a strain hardening modulus of 40 to 50 MPa; and

a GPC_{abs} molecular weight distribution (MWD), as measured by the weight average molecular weight (Mw) divided by the molecular number (Mn) (M_w/M_n), that is from 24 to 29 as determined by an absolute gel permeation chromatography method (GPC_{abs}).

2. The process of claim 1, wherein the density is in the range of 0.943–0.949 g/cm^3; 0.944–0.949 g/cm^3; or 0.945–0.947 g/cm^3; and the melt flow index (I_{21}) is from 5.5 to 7.2 dg/min; 6.0 to 7.0 dg/min; or 6.3 to 7.0 dg/min.

3. The process of claim 1, wherein the unimodal ethylene/α-olefin copolymer has a melt viscosity ratio ($V_{0.1}/V_{100}$) at 190 °C from 50 to 70, 55 to 65, or 55 to 60, where $V_{0.1}$ is the viscosity of the unimodal ethylene/α-olefin copolymer at 190 °C at a frequency of 0.1 radians/second, and V_{100} is the viscosity of the unimodal ethylene/α-olefin copolymer at 190 °C at a frequency of 100 radians/second.

4. The process of claim 1, wherein the GPC_{abs} molecular weight distribution (MWD) is from 25 to 28.

5. The process of claim 1, wherein the unimodal ethylene/α-olefin copolymer has a viscosity ($V_{0.1}$) at 190 °C at a frequency of 0.1 radians/second greater than or equal to 130,000 pascal-seconds.

6. The process of any one of claims 1 to 5, wherein the (C_3–C_{12})α-olefin comonomer is 1-hexene.

7. An unimodal ethylene/α-olefin copolymer comprising polymerized units derived from ethylene, wherein the unimodal ethylene/α-olefin copolymer comprises:

a density from 0.942 g/cm^3 to 0.950 g/cm^3 according to ASTM D792-13;

a flow index (I_{21}) from 5.5 to 7.5 dg/min, when measured according to ASTM D1238 at 190°C and a 21.6 kg load;

Charpy impact strength of 6.5 to 8.5 kilojoules per meter square (kJ/m$^{2)}$, measured at −40° C. according to ISO 179;

a stain hardening modulus of 41 to 45 MPa; and

a GPC_{abs} molecular weight distribution (MWD), as measured by the weight average molecular weight (Mw) divided by the GPC_{abs} molecular number (Mn) (M_w/M_n), that is from 24 to 29 as determined by an absolute gel permeation chromatography method (GPC_{abs}).

8. The unimodal ethylene/α-olefin copolymer of claim 7, wherein the density is in the range of 0.943−0.949 g/cm^3; 0.944−0.949 g/cm^3, or 0.945−0.947 g/cm^3.

9. The unimodal ethylene/α-olefin copolymer of claim 7, wherein the melt flow index (I_{21}) is from 5.5 to 7.2 dg/min; 6.0 to 7.0 dg/min; or 6.3 to 7.0 dg/min.

10. The unimodal ethylene/α-olefin copolymer of claim 7, wherein the unimodal ethylene/α-olefin copolymer has a melt viscosity ratio ($V_{0.1}/V_{100}$) at 190 °C is from 50 to 70, 55 to 65, or 55 to 60, where $V_{0.1}$ is the viscosity of the unimodal ethylene/α-olefin copolymer at 190 °C at a frequency of 0.1 radians/second, and V_{100} is the viscosity of the unimodal ethylene/α-olefin copolymer at 190 °C at a frequency of 100 radians/second..

11. The unimodal ethylene/α-olefin copolymer of claim 7, wherein the GPC_{abs} molecular weight distribution (MWD)(M_w/M_n), is from 25 to 28.

12. The unimodal ethylene/α-olefin copolymer of claim 7, wherein the unimodal ethylene/α-olefin further comprises a environmental stress cracking resistance of greater than 1000 hours.

13. An article comprising the unimodal ethylene/α-olefin copolymer of any one of claims 7 to 12.

14. A process of blow molding a unimodal ethylene/α-olefin copolymer into a blow-molded article, the process comprising:

melting the unimodal ethylene/α-olefin copolymer according to any one of claims 7 to 12 to produce a melt thereof;

extruding the melt into a mold to form a shape; and

injecting a gas into the mold so as to create a cavity within the shape.