CLAIMS

1. A multimodal elastomer comprising a copolymer of ethylene and at least one α-olefin monomer, wherein the multimodal elastomer comprises:

20 to 90% by weight of a high molecular weight (HMW) fraction, wherein the HMW fraction has a number average molecular weight (Mn) of at least 50 kg/mol, when measured according to gel permeation chromatography (GPC), and wherein the HMW fraction comprises at least 35 % by weight ethylene and at least 30 % by weight α-olefin comonomer;

a low molecular weight fraction (LMW) fraction, wherein the LMW fraction has an Mn of 4 to 25 kg/mol, and wherein the LMW fraction comprises at least 50 % by weight ethylene and at least 29 % by weight α-olefin comonomer, and wherein the ratio of the Mn of HMW fraction to the Mn of the LMW fraction is at least 5 to 1;

wherein the multimodal elastomer has a density between 0.853 to 0.875 g/cc, a shear viscosity at 100 rad/s of less than 2,500 Pa-s, and a shear viscosity at 0.1 rad/s of less than 120,000 Pa-s.

2. The multimodal elastomer of claim 1, wherein the α-olefin monomer includes one or more α-olefins selected from C_3-C_{12} α-olefins.

3. The multimodal elastomer of any preceding claim, wherein the α-olefin monomer is 1-octene

4. The multimodal elastomer of any preceding claim, wherein the percent by weight of the α-olefin monomer incorporated in the HMW fraction is greater than the percent by weight of the α-olefin monomer incorporated in the LMW fraction.

5. The multimodal elastomer of any preceding claim, wherein the percent by weight of the α-olefin monomer in the HMW fraction is at least 4 % greater than the percent by weight of the α-olefin monomer in the LMW fraction.

6. The multimodal elastomer of any preceding claim, wherein the multimodal elastomer comprises 50 to 85 wt% of the high HMW fraction.

7. The multimodal elastomer of any preceding claim, wherein the multimodal elastomer has a shear viscosity at 0.1 rad/s of less than 60,000 Pa.s.

8. The multimodal elastomer of any preceding claim, wherein the ratio of the Mn of HMW fraction to the Mn of the LMW fraction is at least 8 to 1.

9. A thermoplastic olefin comprising:

the multimodal elastomer of any of the preceding claims; and

polypropylene.

10. The thermoplastic olefin of claim 9 comprising additional elastomers, block composites, fillers, or combinations.

11. A method of making a multimodal elastomer comprising:

adding to a reactor system at least one ethylene monomer, at least one α-olefin comonomer, a first catalyst comprising a biphenyl phenol complex, a second catalyst comprising a constrained geometry complex;

producing the multimodal elastomer via solution polymerization at a temperature of at least 100 °C,

wherein the multimodal elastomer comprises 20 to 90% by weight of a high molecular weight (HMW) fraction and a low molecular weight (LMW) fraction,

wherein the HMW fraction has a number average molecular weight (Mn) of at least 50 kg/mol, when measured according to gel permeation chromatography (GPC), and wherein the HMW fraction comprises at least 35 % by weight ethylene and at least 30 % by weight α-olefin comonomer, and wherein the LMW fraction has an Mn of 4 to 25 kg/mol, and wherein the LMW fraction comprises at least 50 % by weight ethylene and at least 29 % by weight by weight α-olefin comonomer, and

wherein the multimodal elastomer comprises: a ratio of the Mn of the HMW fraction to the Mn of the LMW fraction of at least 5 to 1; a density between 0.853 to 0.875 g/cc; shear viscosity at 100 rad/s of less than 2,500 Pa-s; and a shear viscosity at 0.1 rad/s shear of less than 120,000 Pa.s.

12. The method of claim 11 wherein the multimodal elastomer comprises 20 to 90% by weight of a high molecular weight (HMW) fraction.

13. The method of claims 11 or 12 wherein the % by weight of the α-olefin monomer in the HMW fraction is at least 4 % greater than the % by weight of the α-olefin monomer in the LMW fraction.

14. The method of any of claims 11-13, wherein the reactor system comprises a single reactor.

15. The method of any of claims 11-13, wherein the reactor system comprises two reactors.