CLAIMS

We claim:

~~1. A polymer composition comprising:~~

(a) a first ethylene-α-olefin copolymer and

(b) a second ethylene-α-olefin copolymer, wherein

(c) the first ethylene-α-olefin copolymer (a) has an ethylene content from about 60 to about 80 wt%;

(d) the second ethylene-α-olefin copolymer (b) has an ethylene content of less than about 60 wt%; and

(e) the first ethylene-α-olefin copolymer (a) has a Melt Flow Rate Ratio (MFRR), defined as the ratio of the MFR measured at 230°C/21.6 kg and at 230°C/2.16 kg, of greater than 30 and optionally has a Melt Flow Rate (MFR) of at least about 1.5 g/10 min measured by ASTM D 1238 condition L (230°C/2.16 kg).

2. The polymer composition of claim 1, wherein the second ethylene-α-olefin copolymer has an ethylene content from about 42 to about 54 wt%.

3. The polymer composition of claim 1 or 2, wherein the first and second ethylene-α-olefin copolymer each comprise one or more comonomers selected from the group consisting of C_3-C_{20} alpha-olefins.

4. The polymer composition of any one of claims 1-3, wherein the composition comprises from about 30 wt% to about 70 wt% of the first ethylene-α-olefin copolymer (a) and about 70 wt% to about 30 wt% of the second ethylene-α-olefin copolymer (b) based upon the total amount of (a) and (b) in the composition.

5. The polymer composition of any one of claims 1-4, wherein the weight average molecular weight of the first ethylene-α-olefin copolymer is about 60,000 g/mol to about 120,000 g/mol.

6. The polymer composition of any one of claims 1-5, wherein the weight average molecular weight of the second ethylene-α-olefin copolymer is about 60,000 g/mol to about 120,000 g/mol.

7. The polymer composition of any one of claims 1-6, wherein the molecular weight distribution of each of the first and second ethylene-α-olefin copolymers is less than about 2.5.

~~8. The polymer composition of any one of claims 1-7, wherein the first ethylene-α-olefin~~ copolymer (a) has both a MFR of at least about 1.5 g/10 min, measured by ASTM D 1238 condition L (230°C/2.16 kg), and a MFRR, defined as the ratio of the MFR measured at 230°C/21.6 kg and at 230°C/2.16 kg, of greater than 30.

9. The polymer composition of any one of claims 1-8, wherein the ethylene content of the first ethylene-α-olefin copolymer is from about 63 to about 77 wt%.

10. The polymer composition of any one of claims 1-9, wherein the MFR of the first ethylene-α-olefin copolymer is up to about 6.5 g/10 min. measured by ASTM D 1238 condition L (230°C/2.16 kg).

11. The polymer composition of any one of claims 1-10, wherein the MFRR of the first ethylene-α-olefin copolymer, defined as the ratio of the MFR measured at 230°C/21.6 kg and at 230°C/2.16 kg, is up to about 55.

12. A lubricating oil composition comprising (i) a lubricating oil basestock, and (ii) a polymer composition comprising:

(a) a first ethylene-α-olefin copolymer and

(b) a second ethylene-α-olefin copolymer, wherein

(c) the first ethylene-α-olefin copolymer (a) has an ethylene content from about 60 to about 80 wt%;

(d) the second ethylene-α-olefin copolymer (b) has an ethylene content of less than about 60 wt%; and

(e) the first ethylene-α-olefin copolymer (a) has a Melt Flow Rate Ratio (MFRR), defined as the ratio of the MFR measured at 230°C/21.6 kg and at 230°C/2.16 kg, of greater than 30 and optionally has a Melt Flow Rate (MFR) of at least about 1.5 g/10 min, measured by ASTM D 1238 condition L (230°C/2.16 kg).

13. The lubricating oil composition of claim 12, wherein the second ethylene-α-olefin copolymer has an ethylene content from about 42 to about 54 wt %.

14. The lubricating oil composition of claim 12 or 13, wherein the first and second ethylene-α-olefin copolymer each comprise one or more comonomers selected from the group consisting of C_3-C_{20} alpha-olefins.

15. The lubricating oil composition of any one of claims 12-14, wherein the polymer composition comprises from about 30 wt% to about 70 wt% of the first ethylene-α-olefin copolymer (a) and about 70 wt% to about 30 wt% of the second ethylene-α-olefin copolymer ~~(b) based upon the total amount of (a) and (b) in the polymer composition.~~

16. The lubricating oil composition of any one of claims 12-15, wherein the weight average molecular weight of the first ethylene-α-olefin copolymer is about 60,000 g/mol to about 120,000 g/mol.

17. The lubricating oil composition of any one of claims 12-16, wherein the weight average molecular weight of the second ethylene-α-olefin copolymer is about 60,000 g/mol to about 120,000 g/mol.

18. The lubricating oil composition of any one of claims 12-17, wherein the molecular weight distributions of the first and second ethylene-α-olefin copolymers are less than about 2.5.

19. The lubricating oil composition of any one of claims 12-18, wherein the first ethylene-α-olefin copolymer (a) has both a MFR of at least about 1.5 g/10 min, measured by ASTM D 1238 condition L (230°C/2.16 kg), and a MFRR, defined as the ratio of the MFR measured at 230°C/21.6 kg and at 230°C/2.16 kg, of greater than 30.

20. The lubricating oil composition of any one of claims 12-19, wherein the lubricating oil composition has a shear stability index of about 20 to about 26.

21. The lubricating oil composition of any one of claims 12-20, wherein the ethylene content of the first ethylene-α-olefin copolymer is from about 63 to about 77 wt%.

22. The lubricating oil composition of any one of claims 12-21, wherein the MFR of the first ethylene-α-olefin copolymer is up to about 6.5 g/10 min., measured by ASTM D 1238 condition L (230°C/2.16 kg).

23. The lubricating oil composition of any one of claims 12-23, wherein the MFRR of the first ethylene-α-olefin copolymer, defined as the ratio of the MFR measured at 230°C/21.6 kg and at 230°C/2.16 kg, is up to about 55.

24. The lubricating oil composition of any one of claims 12-23, wherein the lubricating oil composition has a gel rating of 0 to 1, according to the visual gelation test.

25. A method for reducing gelation in a lubricating oil composition which comprises:

(i) obtaining (a) a first ethylene-α-olefin copolymer and

(b) a second ethylene-α-olefin copolymer, wherein

(c) the first ethylene-α-olefin copolymer (a) has an ethylene content from about 60 to about 80 wt%;

(d) the second ethylene-α-olefin copolymer (b) has an ethylene content of less than about 60 wt%; and

(e) the first ethylene-α-olefin copolymer (a) has a Melt Flow Rate Ratio (MFRR), defined as the ratio of the MFR measured at 230°C/21.6 kg and at 230°C/2.16 kg, of greater than 30 and optionally has a Melt Flow Rate (MFR) of at least about 1.5 g/10 min, measured by ASTM D 1238 condition L (230°C/2.16 kg), and

(f) a lubricating oil basestock, and

(ii) combining said first ethylene-α-olefin copolymer, said second ethylene-α-olefin copolymer and said lubricating oil basestock.

CLAIMS:

1. A polymer composition comprising:

(a) a first ethylene-α-olefin copolymer and

(b) a second ethylene-α-olefin copolymer, wherein

(c) the first ethylene-α-olefin copolymer (a) has an ethylene content from about 60 to about 80 wt %;

(d) the second ethylene-α-olefin copolymer (b) has an ethylene content of less than about 60 wt %; and

(e) the first ethylene-α-olefin copolymer (a) has a Melt Flow Rate Ratio (MFRR), defined as the ratio of the MFR measured at 230°C/21.6 kg and at 230°C/2.16 kg, of greater than 34 and optionally has a Melt Flow Rate (MFR) of at least about 1.5 g/10 min measured by ASTM D 1238 condition L (230°C/2.16 kg).

2. The polymer composition of claim 1, wherein the second ethylene-α-olefin copolymer has an ethylene content from about 42 to about 54 wt %.

3. The polymer composition of claim 1, wherein the first and second ethylene-α-olefin copolymer each comprise one or more comonomers selected from the group consisting of C_3-C_{20} alpha-olefins.

4. The polymer composition of claim 1, wherein the first and second ethylene-α-olefin copolymer each comprise propylene comonomers.

5. The polymer composition of claim 1, wherein the composition comprises from about 30 wt % to about 70 wt % of the first ethylene-α-olefin copolymer (a) and about 70 wt % to about 30 wt % of the second ethylene-α-olefin copolymer (b) based upon the total amount of (a) and (b) in the composition.

6. The polymer composition of claim 1, wherein the composition comprises about 40 wt % to about 60 wt % of the first ethylene-α-olefin copolymer (a) and about 60 wt % to about 40 wt % of the second ethylene-α-olefin copolymer (b) based upon the total amount of (a) and (b) in the composition.

7. The polymer composition of claim 1, wherein the composition comprises about 50 to about 54 wt % of the first ethylene-α-olefin copolymer (a) and about 46 to about 50 wt % of the second ethylene-α-olefin copolymer (b) based upon the total amount of (a) and (b) in the composition.

8. The polymer composition of claim 1, wherein the weight average molecular weight of the first ethylene-α-olefin copolymer is about 60,000 g/mol to about 120,000 g/mol.

9. The polymer composition of claim 1, wherein the weight average molecular weight of the second ethylene-α-olefin copolymer is about 60,000 g/mol to about 120,000 g/mol.

10. The polymer composition of claim 1, wherein the weight average molecular weight of the composition of the first ethylene-α-olefin copolymer and second ethylene-α-olefin copolymer is about 60,000 g/mol to about 120,000 g/mol.

11. The polymer composition of claim 1, wherein the molecular weight distribution of each of the first and second ethylene-α-olefin copolymers is less than about 2.5.

12. The polymer composition of claim 1, wherein the first and second ethylene-α-olefin copolymers are metallocene catalyzed ethylene-α-olefin copolymers.

13. The polymer composition of claim 1, wherein the first ethylene-α-olefin copolymer (a) has both a MFR of at least about 1.5 g/10 min, measured by ASTM D 1238 condition L (230°C/2.16 kg), and a MFRR, defined as the ratio of the MFR measured at 230°C/21.6 kg and at 230°C/2.16 kg, of 34-38.

14. The polymer composition of claim 1, wherein the first ethylene-α-olefin copolymer (a) has both a MFR of at least about 1.6 g/10 min, measured by ASTM D 1238 condition L (230°C/2.16 kg), and a MFRR, defined as the ratio of the MFR measured at 230°C./21.6 kg and at 230°C/2.16 kg, of 34-38.

15. The polymer composition of claim 1, wherein the ethylene content of the first ethylene-α-olefin copolymer is from about 63 to about 77 wt %.

16. The polymer composition of claim 1, wherein the ethylene content of the second ethylene-α-olefin copolymer is less than about 55 wt %.

17. The polymer composition of claim 1, wherein the MFR of the first ethylene-α-olefin copolymer is up to about 6.5 g/10 min. measured by ASTM D 1238 condition L (230°C/2.16 kg).

18. The polymer composition of claim 1, wherein the MFRR of the first ethylene-α-olefin copolymer, defined as the ratio of the MFR measured at 230°C/21.6 kg and at 230°C/2.16 kg, is up to about 55.

19. A lubricating oil composition comprising (i) a lubricating oil basestock, and (ii) a polymer composition comprising:

(a) a first ethylene-α-olefin copolymer and

(b) a second ethylene-α-olefin copolymer, wherein

(c) the first ethylene-α-olefin copolymer (a) has an ethylene content from about 60 to about 80 wt %;

(d) the second ethylene-α-olefin copolymer (b) has an ethylene content of less than about 60 wt %; and

(e) the first ethylene-α-olefin copolymer (a) has a Melt Flow Rate Ratio (MFRR), defined as the ratio of the MFR measured at 230°C/21.6 kg and at 230°C/2.16 kg, of greater than 34 and optionally has a Melt Flow Rate (MFR) of at least about 1.5 g/10 min, measured by ASTM D 1238 condition L (230°C/2.16 kg).

20. The lubricating oil composition of claim 19, wherein the second ethylene-α-olefin copolymer has an ethylene content from about 42 to about 54 wt %.

21. The lubricating oil composition of claim 19, wherein the first and second ethylene-α-olefin copolymer each comprise one or more comonomers selected from the group consisting of C_3-C_{20} alpha-olefins.

22. The lubricating oil composition of claim 19, wherein the first and second ethylene-α-olefin copolymer each comprise propylene.

23. The lubricating oil composition of claim 19, wherein the polymer composition comprises from about 30 wt % to about 70 wt % of the first ethylene-α-olefin copolymer (a) and about 70 wt % to about 30 wt % of the second ethylene-α-olefin copolymer (b) based upon the total amount of (a) and (b) in the polymer composition.

24. The lubricating oil composition of claim 19, wherein the polymer composition comprises about 60 wt % to about 40 wt % of the first ethylene-α-olefin copolymer (a) and about 40 wt % to about 60 wt % of the second ethylene-α-olefin copolymer (b) based upon the total amount of (a) and (b) in the polymer composition.

25. The lubricating oil composition of claim 19, wherein the polymer composition comprises about 50 to 54 wt % of the first ethylene-α-olefin copolymer (a) and about 50 to about 46 wt % of the second ethylene-α-olefin copolymer (b) based upon the total amount of (a) and (b) in the polymer composition.

26. The lubricating oil composition of claim 19, wherein the weight average molecular weight of the first ethylene-α-olefin copolymer is about 60,000 g/mol to about 120,000 g/mol.

27. The lubricating oil composition of claim 19, wherein the weight average molecular weight of the second ethylene-α-olefin copolymer is about 60,000 g/mol to about 120,000 g/mol.

28. The lubricating oil composition of claim 19, wherein the weight average molecular weight of the composition of the first ethylene-α-olefin copolymer and second ethylene-α-olefin copolymer is about 60,000 g/mol to about 120,000 g/mol.

29. The lubricating oil composition of claim 19, wherein the molecular weight distributions of the first and second ethylene-α-olefin copolymers are less than about 2.5.

30. The lubricating oil composition of claim 19, wherein the first and second ethylene-α-olefin copolymers are metallocene catalyzed ethylene-α-olefin copolymers.

31. The lubricating oil composition of claim 19, wherein the first ethylene-α-olefin copolymer (a) has both a MFR of at least about 1.5 g/10 min, measured by ASTM D 1238 condition L (230°C/2.16 kg), and a MFRR, defined as the ratio of the MFR measured at 230°C/21.6 kg and at 230°C/2.16 kg, of greater than 30.

32. The lubricating oil composition of claim 19, wherein the first ethylene-α-olefin copolymer (a) has both a MFR of at least about 1.6 g/10 min, measured by ASTM D 1238 condition L (230°C/2.16 kg), and a MFRR, defined as the ratio of the MFR measured at 230°C/21.6 kg and at 230°C/2.16 kg, of 34-38.

33. The lubricating oil composition of claim 19, wherein (a) the first ethylene-α-olefin copolymer has a MFRR, defined as the ratio of the MFR measured at 230°C/21.6 kg and at 230°C/2.16 kg, of 34-38, and (b) the lubricating oil composition has a shear stability index of less than 20.

34. The lubricating oil composition of claim 31, wherein the lubricating oil composition has a shear stability index of about 20 to about 26.

35. The lubricating oil composition of claim 19, wherein the ethylene content of the first ethylene-α-olefin copolymer is from about 63 to about 77 wt %.

36. The lubricating oil composition of claim 19, wherein the ethylene content of the second ethylene-α-olefin copolymer is less than about 55 wt %.

37. The lubricating oil composition of claim 19, wherein the MFR of the first ethylene-α-olefin copolymer is up to about 6.5 g/10 min., measured by ASTM D 1238 condition L (230°C/2.16 kg).

38. The lubricating oil composition of claim 19, wherein the MFRR of the first ethylene-α-olefin copolymer, defined as the ratio of the MFR measured at 230°C/21.6 kg and at 230°C/2.16 kg, is up to about 55.

39. The lubricating oil composition of claim 19, wherein the MFR of the first ethylene-α-olefin copolymer is up to about 6.5 g/10 min., measured by ASTM D 1238 condition L (230°C/2.16 kg).

40. The lubricating oil composition of claim 19, wherein the MFRR of the first ethylene-α-olefin copolymer, defined as the ratio of the MFR measured at 230°C/21.6 kg and at 230°C/2.16 kg, is up to about 55.39.

41. The lubricating oil composition of claim 31, wherein the lubricating oil composition has a gel rating of 0 to 1, according to the visual gelation test.

42. A method for reducing gelation in a lubricating oil composition which comprises:

(i) obtaining (a) a first ethylene-α-olefin copolymer and

(b) a second ethylene-α-olefin copolymer, wherein

(c) the first ethylene-α-olefin copolymer (a) has an ethylene content from about 60 to about 80 wt %;

(d) the second ethylene-α-olefin copolymer (b) has an ethylene content of less than about 60 wt %; and

(e) the first ethylene-α-olefin copolymer (a) has a Melt Flow Rate Ratio (MFRR), defined as the ratio of the MFR measured at 230°C/21.6 kg and at 230°C/2.16 kg, of greater than 34 and optionally has a Melt Flow Rate (MFR) of at least about 1.5 g/10 min, measured by ASTM D 1238 condition L (230°C/2.16 kg), and

(f) a lubricating oil basestock, and

(ii) combining said first ethylene-α-olefin copolymer, said second ethylene-α-olefin copolymer and said lubricating oil basestock.