CLAIMS

What is claimed is:

1. A composition comprising at least 55 wt. % C_{10} mono-olefins, the C_{10} mono-olefins comprising:

i) from 11 to 45 wt. % 1-decene;

ii) at least 0.5 wt. % 2-butyl-1-hexene;

iii) at least 1 wt. % 3-propyl-1-heptene;

iv) from 0.5 to 12 wt. % wt. % 4-ethyl-1-octene;

v) at least 4 wt. % 4-penten-1-yl-cyclopentane; and

vi) from 2 to 40 wt. % 5-methyl-1-nonene.

2. The composition of claim 1, wherein the C_{10} mono-olefins comprise from 17 to 35 wt. % 1-decene.

3. The composition of claim 1, wherein the C_{10} mono-olefins comprise from 0.75 to 7 wt. % 4-ethyl-1-octene.

4. The composition of claim 1, wherein the C_{10} mono-olefins comprise a weight ratio of 4-penten-1-yl-cyclopentane to 1-decene from 0.3:1 to 1.5:1.

5. The composition of claim 1, wherein the composition comprises:

from 60 to 92 wt. % C_{10} mono-olefins; and

from 3 to 15 wt. % pentylcyclopentane.

6. The composition of claim 5, wherein the C_{10} mono-olefins comprise:

from 1 to 8 wt. % 2-butyl-1-hexene;

from 3 to 25 wt. % 3-propyl-1-heptene;

from 7 to 30 wt. % 4-penten-1-yl-cyclopentane; and

from 6 to 33 wt. % 5-methyl-1-nonene.

7. A composition comprising at least 60 wt. % C_{12} mono-olefins, the C_{12} mono-olefins comprising:

i) at least 8 wt. % 1-dodecene; and

ii) at least 0.5 wt. % 6-hepten-1-yl-cyclopentane;

wherein the composition further comprises heptylcyclopentane and n-dodecane at a weight ratio of heptylcyclopentane to n-dodecane from 0:3:1 to 8:1.

8. The composition of claim 7, wherein the C_{12} mono-olefins comprise:

from 10 to 33 wt. % of 1-dodecene; and

from 2 to 32 wt. % 6-hepten-1-yl-cyclopentane.

9. The composition of claim 7, wherein:

the C_{12} mono-olefins further comprise from 29 to 88 wt. % non-cyclic branched C_{12} mono-olefins; and

the non-cyclic branched C_{12} mono-olefins comprise 5-methyl-1-undecene, 7-methyl-1-undecene, 4-ethyl-1-decene, 6-ethyl-1-decene, 3-propyl-1-nonene, 5-propyl-1-nonene, 2-butyl-1-octene, 3-butyl-1-octene, 4-butyl-1-octene, or any combination thereof.

10. The composition of claim 7, wherein:

the composition comprises from 62 to 97 wt. % C_{12} mono-olefins; and

the weight ratio of heptylcyclopentane to n-dodecane is from 0.5:1 to 2:1.

11. The composition of claim 10, wherein the C_{12} mono-olefins comprise a weight ratio of 1-dodecene to 6-hepten-1-yl-cyclopentane from 0.9:1 to 6:1.

12. A composition comprising at least 60 wt. % C_{14} mono-olefins, the C_{14} mono-olefins comprising:

i) at least 12 wt. % 1-tetradecene; and

ii) at least 0.5 wt. % 8-nonen-1-yl-cyclopentane;

wherein the composition further comprises a total of from 3 to 30 wt. % of n-tetradecane and nonylcyclopentane.

13. The composition of claim 12, wherein the composition comprises a total of from 5 to 25 wt. % n-tetradecane and nonylcyclopentane.

14. The composition of claim 12, wherein the C_{14} mono-olefins comprise:

from 16 to 38 wt. % 1-tetradecene; and

from 2 to 24 wt. % 8-nonen-1-yl-cyclopentane.

15. The composition of claim 12, wherein:

the C_{14} mono-olefins further comprise from 30 to 80 wt. % non-cyclic branched C_{14} mono-olefins; and

the non-cyclic branched C_{14} mono-olefins comprise 7-methyl-1-tridecene, 6-ethyl-1-dodecene, 5-propyl-1-undecene, 4-butyl-1-decene, 3-pentyl-1-nonene, or any combination thereof.

16. The composition of claim 12, wherein:

the composition comprises from 60 to 99 wt. % C_{14} mono-olefins; and

a weight ratio of 1-tetradecene to 8-nonen-1-yl-cyclopentane is from 1:1 to 10:1.

17. A composition comprising:

(a) a C_{10} composition comprising at least 55 wt. % C_{10} mono-olefins, the C_{10} mono-olefins comprising:

i) from 11 to 45 wt. % 1-decene;

ii) at least 0.5 wt. % 2-butyl-1-hexene;

iii) at least 1 wt. % 3-propyl-1-heptene;

iv) from 0.5 to 12 wt. % wt. % 4-ethyl-1-octene;

v) at least 4 wt. % 4-penten-1-yl-cyclopentane; and

vi) from 2 to 40 wt. % 5-methyl-1-nonene;

(b) a C_{12} composition comprising at least 60 wt. % C_{12} mono-olefins, the C_{12} mono-olefins comprising:

i) at least 8 wt. % 1-dodecene; and

ii) at least 0.5 wt. % 6-hepten-1-yl-cyclopentane;

wherein the composition further comprises heptylcyclopentane and n-dodecane at a weight ratio of heptylcyclopentane to n-dodecane from 0:3:1 to 8:1; and

(c) a C_{14} composition comprising at least 60 wt. % C_{14} mono-olefins, the C_{14} mono-olefins comprising:

i) at least 12 wt. % 1-tetradecene; and

ii) at least 0.5 wt. % 8-nonen-1-yl-cyclopentane;

wherein the composition further comprises a total of from 3 to 30 wt. % of n-tetradecane and nonylcyclopentane.

18. The composition of claim 17, wherein the composition comprises:
from 25 to 47 wt. % of the C_{10} composition;
from 30 to 55 wt. % of the C_{12} composition; and
from 12 to 35 wt. % of the C_{14} composition.

19. The composition of claim 18, wherein the composition comprises from 75 to 95 wt. % of C_{10-14} mono-olefins.

20. The composition of claim 17, further comprising C_{16-18} hydrocarbons.

21. The composition of claim 20, wherein:
the composition comprises from 75 to 95 wt. % of C_{10-18} mono-olefins; and
the composition comprises:
from 15 to 40 wt. % of the C_{10} composition;
from 19 to 40 wt. % of the C_{12} composition;
from 7 to 25 wt. % of the C_{14} composition; and
from 18 to 40 wt. % of C_{16-18} hydrocarbons.

22. A composition comprising at least 55 wt. % C_{10} mono-olefins, the C_{10} mono-olefins comprising:
i) from 12 to 42 wt. % 1-decene;
ii) at least 0.5 wt. % 2-butyl-1-hexene;
iii) at least 1 wt. % 3-propyl-1-heptene;
iv) from 0.5 to 12 wt. % wt. % 4-ethyl-1-octene;
v) at least 4 wt. % 4-penten-1-yl-cyclopentane; and
vi) from 2 to 40 wt. % 5-methyl-1-nonene.

23. The composition of claim 22, wherein the C_{10} mono-olefins comprise from 20 to 30 wt. % 1-decene.

24. The composition of claim 22, wherein the C_{10} mono-olefins comprise from 1 to 5 wt. % 4-ethyl-1-octene.

25. The composition of claim 22, wherein the C_{10} mono-olefins comprise a weight ratio of 4-penten-1-yl-cyclopentane to 1-decene from 0.2:1 to 1.2:1.

26. The composition of claim 22, wherein the composition comprises:

from 65 to 85 wt. % C_{10} mono-olefins; and

further comprises from 5 to 13 wt. % pentylcyclopentane.

27. The composition of claim 26, wherein the C_{10} mono-olefins comprise:

from 2 to 6 wt. % 2-butyl-1-hexene;

from 5 to 22 wt. % 3-propyl-1-heptene;

from 10 to 25 wt. % 4-penten-1-yl-cyclopentane; and

from 10 to 28 wt. % 5-methyl-1-nonene.

28. A composition comprising at least 60 wt. % C_{12} mono-olefins, the C_{12} mono-olefins comprising:

i) from 9 to 35 wt. % 1-dodecene; and

ii) at least 0.5 wt. % 6-hepten-1-yl-cyclopentane;

wherein the composition further comprises heptylcyclopentane and n-dodecane at a weight ratio of heptylcyclopentane to n-dodecane from 0:3:1 to 8:1.

29. The composition of claim 28, wherein the C_{12} mono-olefins comprise:

from 12 to 29 wt. % 1-dodecene; and

from 3 to 20 wt. % 6-hepten-1-yl-cyclopentane.

30. The composition of claim 28, wherein:

the C_{12} mono-olefins further comprise from 35 to 85 wt. % non-cyclic branched C_{12} mono-olefins; and

the non-cyclic branched C_{12} mono-olefins comprise 5-methyl-1-undecene, 7-methyl-1-undecene, 4-ethyl-1-decene, 6-ethyl-1-decene, 3-propyl-1-nonene, 5-propyl-1-nonene, 2-butyl-1-octene, 3-butyl-1-octene, 4-butyl-1-octene, or any combination thereof.

31. The composition of claim 28, wherein:

the composition comprises from 70 to 98 wt. % C_{12} mono-olefins; and

the weight ratio of heptylcyclopentane to n-dodecane is from 0.8:1 to 4:1.

32. The composition of claim 31, wherein the C_{12} mono-olefins comprise a weight ratio of 1-dodecene to 6-hepten-1-yl-cyclopentane from 1.5:1 to 4:1.

33. A composition comprising at least 60 wt. % C_{14} mono-olefins, the C_{14} mono-olefins comprising:

i) from 14 to 45 wt. % 1-tetradecene; and

ii) from 0.75 to 28 wt. % 8-nonen-1-yl-cyclopentane;

wherein the composition further comprises a total of from 4 to 28 wt. % of n-tetradecane and nonylcyclopentane.

34. The composition of claim 33, wherein the composition comprises a total of from 6 to 20 wt. % n-tetradecane and nonylcyclopentane.

35. The composition of claim 33, wherein the C_{14} mono-olefins comprise:

from 18 to 36 wt. % 1-tetradecene; and

from 5 to 15 wt. % 8-nonen-1-yl-cyclopentane.

36. The composition of claim 33, wherein:

the C_{14} mono-olefins further comprise from 36 to 78 wt. % non-cyclic branched C_{14} mono-olefins; and

the non-cyclic branched C_{14} mono-olefins comprise 7-methyl-1-tridecene, 6-ethyl-1-dodecene, 5-propyl-1-undecene, 4-butyl-1-decene, 3-pentyl-1-nonene, or any combination thereof.

37. The composition of claim 33, wherein:

the composition comprises from 75 to 98 wt. % C_{14} mono-olefins; and

a weight ratio of 1-tetradecene to 8-nonen-1-yl-cyclopentane is from 1.5:1 to 9:1.

38. A composition comprising:

(a) a C_{10} composition comprising at least 55 wt. % C_{10} mono-olefins, the C_{10} mono-olefins comprising:

i) from 12 to 42 wt. % 1-decene;

ii) at least 0.5 wt. % 2-butyl-1-hexene;

iii) at least 1 wt. % 3-propyl-1-heptene;

iv) from 0.5 to 12 wt. % wt. % 4-ethyl-1-octene;

v) at least 4 wt. % 4-penten-1-yl-cyclopentane; and

vi) from 2 to 40 wt. % 5-methyl-1-nonene;

(b) a C_{12} composition comprising at least 60 wt. % C_{12} mono-olefins, the C_{12} mono-olefins comprising:

i) from 9 to 35 wt. % 1-dodecene; and

ii) at least 0.5 wt. % 6-hepten-1-yl-cyclopentane;

wherein the composition further comprises heptylcyclopentane and n-dodecane at a weight ratio of heptylcyclopentane to n-dodecane from 0:3:1 to 8:1; and

(c) a C_{14} composition comprising at least 60 wt. % C_{14} mono-olefins, the C_{14} mono-olefins comprising:

i) from 14 to 45 wt. % 1-tetradecene; and

ii) from 0.75 to 28 wt. % 8-nonen-1-yl-cyclopentane;

wherein the composition further comprises a total of from 4 to 28 wt. % of n-tetradecane and nonylcyclopentane.

39. The composition of claim 38, wherein the composition comprises:

from 25 to 47 wt. % of the C_{10} composition;

from 30 to 55 wt. % of the C_{12} composition; and

from 12 to 35 wt. % of the C_{14} composition.

40. The composition of claim 39, wherein the composition comprises from 75 to 95 wt. % of C_{10-14} mono-olefins.

41. The composition of claim 38, further comprising C_{16-18} hydrocarbons.

42. The composition of claim 41, wherein:

the composition comprises from 70 to 98 wt. % of C_{10-18} mono-olefins; and

the composition comprises:

from 15 to 40 wt. % of the C_{10} composition;

from 19 to 40 wt. % of the C_{12} composition;

from 7 to 25 wt. % of the C_{14} composition; and

from 18 to 40 wt. % of C_{16-18} hydrocarbons.

43. The composition of claim 42, wherein the composition comprises from 80 to 95 wt. % of C_{10-18} mono-olefins.