Claims

What is claimed is:

1. A fluoropropene composition comprising Z-1,3,3,3-tetrafluoropropene, E-1,3,3,3-tetrafluoropropene, 1,1,3,3,3-pentafluoropropene, and 2,3,3,3-tetrafluoropropene, wherein 2,3,3,3-tetrafluoropropene and 1,1,3,3,3-pentafluoropropene both being present and wherein the total amount of 1,1,3,3,3-pentafluoropropene and 2,3,3,3-tetrafluoropropene is less than 1.0 mol%.

2. The composition of claim 1, wherein the 2,3,3,3-tetrafluoropropene is present in an amount of 0.1 to 0.9 mol%.

3. The composition of claim 1, wherein the 2,3,3,3-tetrafluoropropene is present in an amount of 0.2 to 0.4 mol%.

4. The composition of claim 1, wherein the 2,3,3,3-tetrafluoropropene is present in an amount of 0.3 to 0.4 mol%.

5. The composition of claim 1, wherein the fluoropropene composition additionally comprises one or more of 1,1,1-trifluoroethane (R-143a), 1,1-difluoroethane (R-152a), trifluoropropyne (TFP), 2-chloro-3,3,3-trifluoropropene (R-1233xf), (E)-1-chloro-3,3,3-trifluoropropene (R-1233zd(E)), (Z)-1-chloro-3,3,3-trifluoropropene (R-1233zd(Z)), 1-chloro-2,3,3,3-tetrafluoropropene (R-1224yd), 3-chloro-1,1,3,3-tetrafluoropropene (R-1224zc), 2-chloro-1,1,1,4,4,4-hexafluoro-2-butene (R-1326mxz), 1,1,2-trichloro-1,2,2-trifluoroethane (R-113), difluoromethane (HFC-32), trifluoromethane (R-23), 1,1,1,4,4,4-hexafluorobutane (R-356mff), 1,1,1,3,3-pentafluoropropane (HFC-245fa), 1,1,1,2,2-pentafluoropropane (HFC-245cb), 1,1,3,3-tetrafluoropropene (R-1234zc), 1,1,2,3-tetrafluoropropene (R-1234yc), 1,2,3,3-tetrafluoropropene (HFC-1234ye), 1,1,1,2-tetrafluoroethane (HFC-134a), (Z/E)-1,2,3,3,3-pentafluoropropene (R-1225ye, Z and E), 1,2-dichloro-tetrafluoroethane (R-114), 1-chloro-1,2,2,2-tetrafluoroethane (R-124), and 1,1,1,3,3,3-hexafluoropropane (HFC-236fa).

6. The composition of claim 5, wherein the sum total of the amounts of R-143a, R-152a, TFP, R-1233xf, R-1233zd(E), R-1233zd(Z), R-1224yd, R-1224zc,

R-1326mxz, R-113, HFC-32, R-23, R-356mff, HFC-245fa and HFC-245cb is between 0.001 mole percent and 2 mole percent, based on the total fluoropropene composition.

7. The composition of claim 1, wherein the fluoropropene composition includes (E)-1-chloro-3,3,3-trifluoropropene (R-1233zd(E)) in an amount of 0.7 mole percent to 1.15 mole percent, based on the total fluoropropene composition.

8. The composition of claim 1, wherein the fluoropropene composition includes (Z)-1-chloro-3,3,3-trifluoropropene (R-1233zd(Z)) in an amount of 0.05 mole percent to 0.25 mole percent, based on the total fluoropropene composition.

9. The composition of claim 1, wherein the fluoropropene composition includes 1,1,1-trifluoroethane (R-143a) in an amount of 0.05 mole percent to 0.25 mole percent, based on the total fluoropropene composition.

10. The composition of claim 1 wherein the composition is near azeotropic.

11. The composition of claim 10 further comprising at least one member selected from the group consisting of 1,2,3,3-tetrafluoropropene (HFC-1234ye), 3,3,3-trifluoropropene (HFC-1243zf), difluoromethane (HFC-32), pentafluoroethane (HFC-125), 1,1,2,2-tetrafluoroethane (HFC-134), 1,1,1,2-tetrafluoroethane (HFC-134a), 1,1,1-trifluoroethane (HFC-143a), 1,1,-difluoroethane (HFC-152a), fluoroethane (HFC-161), 1,1,1,2,3,3,3-heptafluoropropane (HFC-227ea), 1,1,1,2,3,3-hexafluoropropane (HFC-236ea), 1,1,1,3,3,3-hexafluoropropane (HFC-236fa), 1,1,1,3,3-pentafluoropropane (HFC-245fa), 1,1,1,3,3-pentafluorobutane (HFC-365mfc), E-1,1,1,4,4,4-hexafluorobut-2-ene (R-1336mzz(E)), propane, n-butane, isobutane, 2-methylbutane, n-pentane, cyclopentane, dimethylether, bis(trifluoromethyl) sulphide (CF_3SCF_3), carbon dioxide (CO_2), and trifluoro-iodomethane (CF_3I).

12. A refrigerant composition comprising Z-1,3,3,3-tetrafluoropropene, E-1,3,3,3-tetrafluoropropene, 1,1,3,3,3-pentafluoropropene, and 2,3,3,3-tetrafluoropropene and at least one member selected from the following groups:

(a) comprising one or more of 1,1,1-trifluoroethane (R-143a), 1,1-difluoroethane (R-152a), trifluoropropyne (TFP), 2-chloro-3,3,3-trifluoropropene (R-1233xf), (E)-1-chloro-3,3,3-trifluoropropene (R-1233zd(E)), (Z)-1-chloro-3,3,3-trifluoropropene (R-1233zd(Z)), 1-chloro-2,3,3,3-tetrafluoropropene (R-1224yd), 3-chloro-1,1,3,3-tetrafluoropropene (R-1224zc), 2-chloro-1,1,1,4,4,4-hexafluoro-2-butene (R-1326mxz), 1,1,2-trichloro-1,2,2-trifluoroethane (R-113), difluoromethane (HFC-32), trifluoromethane (R-23), 1,1,1,4,4,4-hexafluorobutane (R-356mff), 1,1,1,3,3-pentafluoropropane (HFC-245fa), 1,1,1,2,2-pentafluoropropane (HFC-245cb), 1,1,3,3-tetrafluoropropene (R-1234zc), 1,1,2,3-tetrafluoropropene (R-1234yc), 1,2,3,3-tetrafluoropropene (HFC-1234ye), 1,1,1,2-tetrafluoroethane (HFC-134a), (Z/E)-1,2,3,3,3-pentafluoropropene (R-1225ye (Z and E)), 1,2-dichloro-tetrafluoroethane (R-114), 1-chloro-1,2,2,2-tetrafluoroethane (R-124), and 1,1,1,3,3,3-hexafluoropropane (HFC-236fa),

(b) comprising one or more of R-143a, R-152a, TFP, R-1233xf, R-1233zd(E), R-1233zd(Z), R-1224yd, R-1224zc, R-1326mxz, R-113, HFC-32, R-23, R-356mff, R-1326mxz, HFC-245fa and HFC-245cb,

(c) comprising one or more of HFC-1234ye, 3,3,3-trifluoropropene (HFC-1243zf), HFC-32, pentafluoroethane (HFC-125), 1,1,2,2-tetrafluoroethane (HFC-134), HFC-134a, HFC-143a, HFC-152a, fluoroethane (HFC-161), 1,1,1,2,3,3,3-heptafluoropropane (HFC-227ea), 1,1,1,2,3,3-hexafluoropropane (HFC-236ea), HFC-236fa, HFC-245fa, 1,1,1,3,3-pentafluorobutane (HFC-365mfc), E-1,1,1,4,4,4-hexafluorobut-2-ene (R-1336mzz(E)), propane, n-butane, isobutane, 2-methylbutane, n-pentane, cyclopentane, dimethylether, bis(trifluoromethyl) sulphide (CF_3SCF_3), carbon dioxide (CO_2), and trifluoro-iodomethane (CF_3I); and,

(d) combinations thereof.

13. The refrigerant composition of claim 12, wherein the refrigerant composition comprises greater than about 99 wt% E-1,3,3,3-tetrafluoropropene and less than about 1,000 ppm of Z-1,3,3,3-tetrafluoropropene.

14. A process for transferring heat, comprising:

providing an article;

contacting the article with a heat transfer media;

wherein the heat transfer media comprises the fluoropropene composition of claim 1 or claim 12.

15. A refrigeration system, comprising:

an evaporator; a condenser;

a compressor;

an expansion device; and a heat transfer media;

wherein the heat transfer media comprises the fluoropropene composition of claim 1 or claim 12.