Claims

What is claimed is:

1. A refrigerant composition comprising Z-1,3,3,3-tetrafluoropropene (HFO-1234ze(Z)), E-1,3,3,3,- tetrafluoropropene (HFO-1234ze(E)), 2,3,3,3-tetrafluoropropene (HFO-1234yf), and additional compounds comprising 1,1,1,3,3-pentafluoropropane (HFC-245fa), 3,3,3-trifluoropropene (HFO-1243zf), and 1,1,1,2,2-pentafluoropropane (HFC-245cb), wherein based on the total fluoroolefin composition the amount of HFO-1234ze(E) is about 99 mole percent, the HFO-1234ze(Z) is present and in an amount up to 1000 ppm, and the amount of HFO-1234yf is from 0.001 mole percent to 0.9 mole percent.

2. The composition of claim 1, wherein the 2,3,3,3-tetrafluoropropene (HFO-1234yf) 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 (HFO-1234yf) 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 (HFO-1234yf) is present in an amount of 0.3 to 0.4 mol%.

5. The composition of claim 1, wherein the refrigerant composition additionally comprises one or more of 1,1,1-trifluoroethane (R-143a), 1,1-difluoroethane (R-152a), trifluoro propyne (TFP), 2-chloro-3,3,3-trifluoropropene (R-1233xf), 1-chloro-3,3,3-trifluoropropene (R-1233zd(E)), (Z)-1-chloro-3,3,3-trifluoropropene (R-1233zd(Z)), (Z)-2,3,3,3,-tetrafluoro-1-chloropropene (1224yd), 3,3-tetrafluoropropene (1224zc), 2-chloro-1,1,1,4,4,4-hexafluorobut-2-ene (1326mxz), 1,1,2-trichlorotrifluoroethane (113), difluoromethane (32), trifluoromethane (23), 1,1,1,4,4,4-hexafluorobutane (356mff), and 1,1,1,4,4,4-hexafluoro-2-chlorobut-2-ene (1326mxz).

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), 1224yd, 1224zc, 1326mxz, 113, 32, 23, 356mff, 1326mxz, and HFC-245cb is between 0.001 mol% and 2 mol%, based on the total fluoroolefin composition.

7. The composition of any one of claims 1 to 4, wherein the refrigerant composition further comprises R-1233zd(E) in an amount of 0.7 mol% to 1.15 mol%, based on the total fluoroolefin composition.

8. The composition of any one of claims 1 to 4, wherein the refrigerant composition further comprises R-1233zd(Z) in an amount of 0.05 mol% to 0.25 mol%, based on the total fluoroolefin composition.

9. The composition of any one of claims 1 to 4, wherein the refrigerant composition further comprises R-143a in an amount of 0.05 mol% to 0.25 mol%, based on the total fluoroolefin composition.

10. The composition of any one of claims 1 to 9, wherein the refrigerant 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-tetrafluoro-1-propene (HFC-1234ye), pentafluoroethane (HFC-125), tetrafluoroethane (HFC-134), 1,1,1,2-tetrafluoroethane (HFC-134a), 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), pentafluorobutane (HFC-365mfc), propane, n-butane, isobutane, 2-methylbutane, n-pentane, cyclopentane, dimethylether, CF_3SCF_3, CO_2, and CF_3I.

12. A process for transferring heat, comprising:

providing an article;

contacting the article with a heat transfer media;

wherein the heat transfer media comprises the refrigerant composition of any one of claims 1 to 11.

13. 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 refrigerant composition of any one of claims 1 to 11.