Claims

1. A refrigerant fluoropropene composition comprising E-1,3,3,3-tetrafluoropropene, 1,1,3,3,3-pentafluoropropene, and 2,3,3,3-tetrafluoropropene,

   wherein the total amount of 1,1,3,3,3-pentafluoropropene and 2,3,3,3-tetrafluoropropene is 1.0 wt.% or less, based on the total weight of the fluoropropene composition, wherein the 2,3,3,3-tetrafluoropropene is present in the fluoropropene composition in an amount of at least 0.001 wt.% based on the total weight of the fluoropropene composition, and wherein the 1,1,3,3,3-pentafluoropropene is present in the fluoropropene composition in an amount of at least 0.001 wt.% based on the total weight of the fluoropropene composition.

2. The composition of claim 1, wherein the 2,3,3,3-tetrafluoropropene is present in the fluoropropene composition in an amount of 0.001 to 0.8 wt.%, based on the total weight of the fluoropropene composition.

3. The composition of claim 1 or claim 2, wherein the 2,3,3,3-tetrafluoropropene is present in the fluoropropene composition in an amount of 0.1 to 0.6 wt.%, or 0.3 to 0.4 wt.%, based on the total weight of the fluoropropene composition.

4. The composition of any one of claims 1 to 3, wherein the 1,1,3,3,3-pentafluoropropene is present in the fluoropropene composition in an amount of 0.001 to 0.8 wt.%, based on the total weight of the fluoropropene composition.

5. The composition of any one of claims 1 to 4, wherein the 1,1,3,3,3-pentafluoropropene is present in the fluoropropene composition in an amount of 0.01 to 0.6 wt.%, or 0.1 to 0.4 wt.%, based on the total weight of the fluoropropene composition.

6. The composition of any one of claims 1 to 5, wherein the E-1,3,3,3-tetrafluoropropene is present in the fluoropropene composition in an amount of

50.0 wt.% or more, based on the total weight of the fluoropropene composition.

7. The composition of any one of claims 1 to 6, wherein the E-1,3,3,3-tetrafluoropropene is present in the fluoropropene composition in an amount of 75.0 wt.% or more, or 99.0 wt.% or more, 99.5 wt.% or more, or 99.8 wt.% or more, based on the total weight of the fluoropropene composition.

8. The composition of any one of claims 1 to 7, wherein the total amount of 2,3,3,3-tetrafluoropropene and 1,1,3,3,3-pentafluoropropene in the fluoropropene composition is 0.1 to 0.8 wt.%, based on the total weight of the fluoropropene composition.

9. The composition of any one of claims 1 to 8, wherein the total amount of 2,3,3,3-tetrafluoropropene and 1,1,3,3,3-pentafluoropropene in the fluoropropene composition is 0.3 to 0.5 wt.%, based on the total weight of the fluoropropene composition.

10. The composition of any one of claims 1 to 9, additionally comprising 1,1,2,2-tetrafluoroethane (R-134) in the fluoropropene composition; or additionally comprising E-1,1,1,4,4,4-hexafluorobut-2-ene (R-1336mzzE) and/or 1,1,1,2,3,3,3-heptafluoropropane (R-227ea) in the fluoropropene composition.

11. The composition of claim 10, wherein R-134 is present in the fluoropropene composition in an amount of 1.0 to 40.0 wt.%, or 30.0 to 40.0 wt.%, or 35.0 to 40.0 wt.%, based on the total weight of the fluoropropene composition; or R-1336mzzE is present in the fluoropropene composition in an amount of 15.0 to 20.0 wt.%, based on the total weight of the fluoropropene composition and/or R-227ea is present in the fluoropropene composition in an amount of 2.0 to 5.0 wt.%, based on the total weight of the fluoropropene composition.

12. The composition of any one of claims 1 to 11, wherein the composition additionally comprises 1,1,1,2-tetrafluoroethane (HFC-134a).

13. The composition of any one of claims 1 to 12, wherein the composition is a near-azeotropic composition.

14. The composition of any one of claims 1 to 13, further comprising a lubricant selected from the group consisting of mineral oils, such as paraffins, naphthenes and aromatics, alkylaryls, such as linear and branched alkylbenzenes, synthetic paraffins, synthetic naphthenes, poly(alphaolefins), polyol esters, polyalkylene glycols, and polyvinyl ethers.

15. A refrigeration system, comprising:

an evaporator; a condenser; a compressor; an expansion device; and a heat transfer medium;

wherein the heat transfer medium comprises the refrigerant fluoropropene composition of any one of claims 1 to 14.

16. A chiller apparatus comprising the refrigerant fluoropropene composition of any one of claims 1 to 14.

17. Use of the refrigerant fluoropropene composition of any one of claims 1 to 14 in a chiller apparatus, or in a medium temperature chiller apparatus.

18. A method of cooling, the method comprising: evaporating the refrigerant fluoropropene composition of any one of claims 1 to 14 in the vicinity of a body to be cooled and thereafter condensing the composition.

19. A method for replacing a high GWP refrigerant in a refrigeration, air conditioning, or heat pump apparatus, wherein the high GWP refrigerant is selected from the group consisting of 1,1,1,2-tetrafluoroethane (R134a), chlorodifluoromethane (R22), 2,2-dichloro-1,1,1-trifluoroethane (R123), trichlorofluoromethane (R11), 1,1,1,3,3-pentafluoropropane (R245fa), 1,2-dichlorotetrafluoroethane (R114), 1,1,1,3,3,3-hexafluoropropane (R236fa), 1-chloro-1,2,2,2-tetrafluoroethane (R124), dichlorodifluoromethane (R12), difluoromethane/pentafluoroethane (R410A), difluoromethane/pentafluoroethane/1,1,1,2-tetrafluoroethane (R407C), pentafluoroethane/1,1,1,2-tetrafluoroethane/butane (R417A), pentafluoroethane/1,1,1,2-tetrafluoroethane/isobutane (R422A), pentafluoroethane/1,1,1-trifluoroethane (R507A), chlorodifluoromethane/ chloropentafluoroethane (R502), and pentafluoroethane/1,1,1-trifluoroethane/ 1,1,1,2-tetrafluoroethane (R404A), the method comprising providing the refrigerant fluoropropene composition of any one of claims 1 to 14 to the

refrigeration, air conditioning, or heat pump apparatus that uses, used or is designed to use the high GWP refrigerant.

20. A refrigeration apparatus, air-conditioning apparatus, or heat pump apparatus containing the refrigerant fluoropropene composition of any one of claims 1 to 14, wherein the refrigeration apparatus is a stationary or mobile refrigeration apparatus, or the air-conditioning apparatus is a mobile air-conditioning apparatusor an automobile air-conditioning apparatus.