TITLE

COMPOSITIONS COMPRISING 2,3,3,3-TETRAFLUOROPROPENE, 1,1,2,3-TETRACHLOROPROPENE, 2-CHLORO-3,3,3-TRIFLUOROPROPENE, OR 2-CHLORO-1,1,1,2-TETRAFLUOROPROPANE

FIELD OF THE INVENTION

The present disclosure relates to the field of compositions which may be useful as heat transfer compositions, aerosol propellants, foaming agents (blowing agents), solvents, cleaning agents, carrier fluids, displacement drying agents, buffing abrasion agents, polymerization media, foaming agents for polyolefins and polyurethane, gaseous dielectrics, extinguishing agents, and fire suppression agents in liquid or gaseous form. In particular, the present disclosure relates to compositions which may be useful as heat transfer compositions, such as 2,3,3,3-tetrafluoropropene (HFO-1234yf, or 1234yf) or the compositions comprising 1,1,1,2,3-pentafluoropropane (HFC-245eb, or 245eb) which are useful in processes to produce HFO-1234yf.

BACKGROUND OF THE INVENTION

New environmental regulations have led to the need for new compositions for use in refrigeration, air-conditioning and heat pump apparatus. Low global warming potential compounds are of particular interest.

SUMMARY OF THE INVENTION

Applicants have found that in preparing such new low global warming potential compounds, such as HFO-1234yf, that certain additional compounds are present in small amounts.

In one aspect, in accordance with the present invention, there is provided a composition comprising HFO-1234yf and at least one additional compound selected from the group consisting of HCO-1250xf, HCC-260da, HCC-240aa, HCO-1230xa, HCFO-1233xf, HCFO-1233zd,

HCFC-244bb, HCFC-244db, HFO-1234ze, HFC-245cb, HFO-1243zf, HCFO-1223za, HCFO-1224zb, HFO-1225zc, HCFC-241db, HCFC-242dc, HCFO-1232xf, HCFO-1231xf, and HCFO-1233yf. The composition may contain less than about 1 weight percent of the at least one additional compound, based on the total weight of the composition.

In another aspect, in accordance with the present invention, there is provided a composition comprising HCO-1230xa and at least one additional compound selected from the group consisting of propylene, HCO-1260zf, HCC-260da, HCC-260db, HCO-1250xf, HCC-250aa, and HCC-240aa.

In another aspect, in accordance with the present invention, there is provided a composition comprising HCFO-1233xf and at least one additional compound selected from the group consisting of propylene, HCO-1260zf, HCC-260da, HCC-260db, HCO-1250xf, HCC-250aa, HCC-240aa, HCO-1230xa, HFO-1243zf, HCFO-1223za, HCFO-1224zb, HFO-1225zc, HCFO-1233yf, HCFO-1232xf, HCFC-1231xf, HCFC-241db, and HCFC-242dc.

In another aspect, in accordance with the present invention, there is provided a composition composition comprising HCFC-244bb and at least one additional compound selected from the group consisting of propylene, HCO-1250xf, HCC-260da, HCC-260db, HCC-240aa, HCO-1230xa, HCFO-1233xf, HFO-1243zf, HCFO-1223az, HCFO-1224zb, HFO-1225zc, HCFC-241db, HCFC-242dc, HCFO-1232xf, HCFO-1231xf, and HCFC-1233yf.

In another aspect, there is provided a method for producing cooling comprising evaporating the composition as described herein in the vicinity of a body to be cooled, and thereafter condensing said composition.

In another aspect, there is provided a method for producing heat comprising condensing the composition as described herein in the vicinity of a body to be heated, and thereafter evaporating said compositions.

In another aspect, there is provided a method of forming a foam comprising: (a) adding to a foamable composition as described herein;

and (b) processing the foamable composition under conditions effective to form a foam.

In another aspect, there is provided a process for producing aerosol products comprising the step of adding the composition as described herein to a formulation, including active ingredients in an aerosol container, wherein said composition functions as a propellant.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows a reaction sequence useful for formation of compositions of the present invention.

DETAILED DESCRIPTION

Compositions

HFO-1234yf (2,3,3,3-tetrafluoropropene) has been suggested for