includes 20 vol% to 99 vol% of a mineral distillate boiling range fraction. Additionally or alternately, in some aspects the composition further includes 10 vol% to 99 vol% of a bio-derived component different from the blend component. The composition can have a cetane number of 40 or more, a cloud point that is at least 5.0°C lower than a cloud point of the mineral distillate boiling range fraction and/or bio-derived component, and/or a cloud point of -10°C or less.

[0006] In various aspects, a fuel oil or fuel oil blend component composition is also provided. The composition includes 1.0 vol% to 75 vol% of a blend component comprising an isoparaffinic blend component, an iso-olefinic blend component, or a combination thereof. In some aspects, the composition further includes 25 vol% to 95 vol% of a mineral fraction. Additionally or alternately, in some aspects the composition further includes 5.0 vol% to 50 vol% of a bio-derived component different from the blend component and 15 vol% or more of a mineral fraction. The composition can have a density at 15°C of 0.880 g/cm^3 to 0.990 g/cm^3, a calculated carbon aromaticity index of 780 or more, a flash point of 60°C or more, and/or a sulfur content of 5000 wppm or less. Optionally, a pour point of the composition can be lower than a pour point of the mineral fraction and/or the bio-derived component.

[0007] In various aspects, a marine distillate or marine distillate blend component composition is also provided. The composition includes 1.0 vol% to 90 vol% of a blend component comprising an isoparaffinic blend component, an iso-olefinic blend component, or a combination thereof. The composition further includes 10 vol% to 99 vol% of a mineral fraction, a bio-derived component different from the blend component, or a combination thereof. The composition can have a density at 15°C of 0.780 g/cm^3 to 0.890 g/cm^3 or less, a cetane number of 40 or more, and/or a flash point of 43°C or more. Optionally, a pour point of the composition can be at least 5°C lower than a pour point of the mineral fraction, the bio-derived fraction, or the combination thereof.

BRIEF DESCRIPTION OF THE DRAWING

[0008] Fig. 1 shows results from ^{1}H NMR characterization of iso-olefinic and isoparaffinic blend components.

DETAILED DESCRIPTION OF THE INVENTION

[0009] In various aspects, compositions are provided that include at least a portion of an isoparaffinic blend component, an iso-olefinic blend component, or a combination thereof,

corresponding to 30 wt% iso-olefinic blend component / 70 wt% isoparaffinic blend component and 70 wt% iso-olefinic blend component / 30 wt% isoparaffinic blend component.

[00131] The iso-olefinic blend component, the isoparaffinic blend component, and the two mixtures were characterized using ^{1}H NMR to characterize the ratio of Hd hydrogens to Hc_2 hydrogens, as determined from the ^{1}H NMR results. Fig. 1 shows results from the ^{1}H NMR analysis. In Fig. 1, the first column of data corresponds to data for the substantially fully saturated isoparaffinic blend component (IPB-1 – Column A). The second column and third column show the mixtures corresponding to 70 wt% isoparaffins (column B) and 30 wt% isoparaffins (column C), while the final column corresponds to data for the iso-olefinic blend component (column D), as made from the oligomerization process. As shown in Fig. 1, the isoparaffinic blend component had a ratio of Hd hydrogens to Hc_2 hydrogens of 1.19.

[00132] For comparison with the values shown in Fig. 1, a variety of other types of fractions were also characterized using ^{1}H NMR to determine the ratio of Hd hydrogens to Hc_2 hydrogens. Table 11 shows the values that were obtained for these various other types of fractions. Where a range is given, this indicates that multiple different samples were characterized, with the range corresponding to the minimum and maximum values.

Table 11 – Ratio of Hd / Hc_2 hydrogens as Determined by ^{1}H NMR for Other Components

Sample Type	Hd to Hc_2 Ratio
JET A-1	0.75
Diesel	0.57 – 1.00
Gas Oil	0.54
Primarily Isoparaffin Liquid (formed by catalytic isomerization)	2.50 – 3.21
Primarily N-Paraffin Liquid	0.24 – 0.33
Naphthenic Liquid (Petroleum Distillate)	2.35
Fischer-Tropsch Liquid	0.37

[00133] As shown in Table 6, liquids with high n-paraffin contents tend to have ratios of Hd hydrogens to Hc_2 hydrogens that are well below 1.00. Commercial fuel products generally have ratios below 1.00, although a high isoparaffin content / low aromatic content diesel can