

CLAIMS:

1. A fuel composition having low sulfur content, the fuel composition having the following enumerated properties: a sulfur content of about 0.50% or less by weight of the fuel composition; a calculated carbon aromaticity index of about 870 or less; a density at 15 °C of about 900 kg/m³ to about 1,010 kg/m³; a kinematic viscosity at 50 °C of about 100 centistokes to about 700 centistokes; and an estimated cetane number of about 7 or greater.
2. The fuel composition of claim 1, wherein the sulfur content is about 0.40 wt.% to about 0.5 wt.%.
3. The fuel composition of claims 1 or 2, wherein the calculated aromaticity index is about 800 to about 870, wherein the density at 15 °C of about 900 kg/m³ to about 1,010 kg/m³ is about 950 kg/m³ to about 1,000 kg/m³, and wherein the kinematic viscosity at 50 °C is about 100 centistokes to about 380 centistokes, and estimated cetane number is about 7 to about 35.
4. The fuel composition of any preceding claim, wherein the fuel composition is a residual marine fuel.
5. The fuel composition of any preceding claim, wherein the fuel composition comprises a residual component and at least one petroleum distillate fraction.
6. The fuel composition of claim 5, wherein the residual component comprises a vacuum residual.
7. The fuel composition of claim 5, wherein the residual component comprises a vacuum residual and FCC bottoms.
8. The fuel composition of any one of claims 5 to 7, wherein the petroleum distillate fraction is present in an amount of about 25 vol.% of greater and has a cetane index of about 8 to about 29.
9. The fuel composition of any one of claims 5 to 7, wherein the petroleum distillate fraction is present in an amount of about 10 vol.% of greater and has a cetane index of about 30 or greater.
10. The fuel composition of any one of claims 1 to 4, wherein the fuel composition comprises a residual component in an amount of about 50 vol.% to about 80 vol.% and a petroleum distillate fraction in an amount of about 20 vol.% to about 50 vol.%, wherein the petroleum distillate fraction has a cetane index of from about 8 to about 29.
11. The fuel composition of any one of claims 1 to 4, wherein the fuel composition comprises a first residual component in an amount of about 40 vol.% to about 65 vol.%, a second residual component in an amount of about 5 vol.% to about 20 vol.%, and a petroleum distillate fraction in an amount of about 15 vol.% to about 55 vol.%, wherein the petroleum distillate fraction has a cetane index of from about 8 to about 29.

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12. The fuel composition of any one of claims 1 to 4, wherein the fuel composition comprises a residual component in an amount of about 45 vol.% to about 65 vol.%, a first petroleum distillate fraction in an amount of about 30 vol.% to about 40 vol.%, and a second petroleum distillate fraction in an amount of about 5 vol.% to about 25 vol.%, wherein the first petroleum distillate fraction has a cetane index of about 8 to about 29, and wherein the second petroleum distillate fraction has a cetane index of about 30 or greater.

13. The fuel composition of any one of claims 1 to 4, wherein the fuel composition comprises a first residual component in an amount of about 45 vol.% to about 65 vol.%, a second residual component in an amount of about 5 vol.% to about 20 vol.%, and a petroleum distillate fraction in an amount of about 5 vol.% to about 40 vol.%, wherein the petroleum distillate fraction has a cetane index of about 30 or greater.

14. The fuel composition of any one of claims 1 to 4, wherein the fuel composition comprises a first residual component in an amount of about 40 vol.% to about 60 vol.%, a second residual component in an amount of about 5 vol.% to about 20 vol.%, a first petroleum distillate fraction in an amount of about 10 vol.% to about 40 vol.%, and a second petroleum distillate fraction in an amount of about 5 vol.% to about 30 vol.%, wherein the first petroleum distillate fraction has a cetane index of about 8 to about 29, and wherein the second petroleum distillate fraction has a cetane index of about 30 or greater.

15. The fuel composition of any one of claims 1 to 4, wherein the fuel composition comprises a residual component having a T50 of about 615 °C or greater and a first distillate fraction having a density of about 910 kg/m³ or less, and wherein the fuel composition is further characterized by at least one of the following: (i) an amount of about 25 vol.% or greater of the first distillate fraction with a cetane index of about 8 to about 29 or (ii) further comprising a second distillate fraction in an amount of about 10 vol.% or greater with a cetane index of about 30 or greater.

16. A method of blending fuel compositions, comprising: blending one or more residual components and one or more petroleum distillate fractions to prepare a fuel composition, wherein the fuel composition has the following enumerated properties: a sulfur content of about 0.50% or less by weight of the fuel composition; a calculated carbon aromaticity index of about 870 or less; a density at 15 °C of about 900 kg/m³ to about 1,010 kg/m³; a kinematic viscosity at 50 °C of about 100 centistokes to about 700 centistokes; and an estimated cetane number of about 7 or greater.

17. The method of claim 16, wherein the calculated aromaticity index is about 800 to about 870, wherein the density at 15 °C of about 900 kg/m³ to about 1,010 kg/m³ is about 950 kg/m³ to about 1,000 kg/m³, and wherein the kinematic viscosity at 50 °C is about 100 centistokes to about 380 centistokes, and estimated cetane number is about 7 to about 35.

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18. The method of claims 16 or 17, wherein the petroleum distillate fraction comprises at least one of (i) a first distillate fraction in an amount of about 25 vol.% of greater with a cetane index of about 8 to about 29; or (ii) a second distillate fraction in an amount of about 10 vol.% of greater with a cetane index of about 30 or greater.

19. The method of any of claims 16 to 18, wherein the one or more residual components comprises a residual component having a T50 of about 615 °C or greater, and wherein one or more petroleum distillate fractions comprises a first distillate fraction having a density of about 910 kg/m³ or less.

20. The method of any one of claims 16 to 19, wherein the blending comprises blending an additional distillate fraction in an amount of about 10 vol.% of greater with a cetane index of about 30 or greater to enhance combustion quality of the fuel composition.