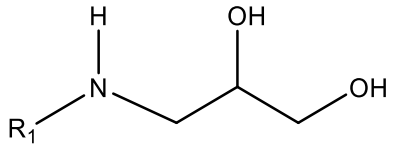
CLAIMS

1. A fuel composition comprising (1) greater than 50 wt. % of a hydrocarbon fuel boiling in gasoline or diesel range and (2) a minor amount of one or more primary or secondary amino alkanediol or an alkyl carboxylic acid salt of the primary or secondary amino alkanediol, wherein the one or more primary or secondary amino alkanediol contains a total of less than 12 carbon atoms.

2. The fuel composition of claim 1, wherein structure of the amino alkanediol is



wherein R_1 is an H or an aliphatic group.

3. The fuel composition of claim 2, wherein the aliphatic group is one of the following hydrocarbon chain: pentyl group, hexyl group, heptan-2-yl group, octyl group, 2-methylhexyl group, 2-ethylhexyl group, or 4-methylhexyl group.

4. The fuel composition of claim 1, wherein the alkyl carboxylic acid is one of the following acids: 2-ethyl hexanoic acid, 2-propyl hexanoic acid, 2-ethyl heptanoic acid, 2-propyl heptanoic acid, butyric acid, hexanoic acid, 3-methylhexanoic acid, 2-methyloctanoic acid, or 2-ethylnonanoic acid.

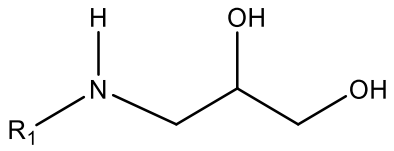
5. The fuel composition of claim 1, wherein the amino alkanediol or the alkyl carboxylic acid salt of the primary or secondary amino alkanediol is present in about 25 to 5000 ppm by weight.

6. The fuel composition of claim 1, further comprising:

oxygenate, anti-knock agent, detergent, dispersant, friction modifier, antioxidant, metal deactivator, demulsifier, pour point depressant, flow improver, cetane improver, or lubricity additive.

7. The fuel composition of claim 1, wherein the alkyl carboxylic acid salt of the primary or secondary amino alkanediol is compositionally limited to the following elements: C, N, O, and H.

8. A fuel composition comprising (1) greater than 50 wt. % of a hydrocarbon fuel boiling in the gasoline or diesel range and (2) a minor amount of an alkyl carboxylic acid salt of the primary or secondary amino alkanediol, wherein the primary or secondary amino alkanediol is



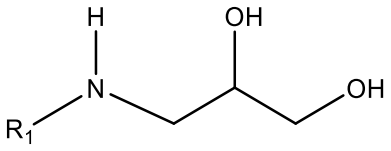
wherein R_1 is an H or an aliphatic group, wherein the primary or secondary amino alkanediol contains a total of less than 12 carbon atoms.

9. The fuel composition of claim 8, wherein the aliphatic group is one of the following hydrocarbon chain: propyl group, butyl group, pentyl group, hexyl group, heptyl group, or octyl group.

10. The fuel composition of claim 8, wherein the alkyl carboxylic acid is one of the following acids: 2-ethyl hexanoic acid, 2-propyl hexanoic acid, 2-ethyl heptanoic acid, 2-propyl heptanoic acid, butyric acid, hexanoic acid, 3-methylhexanoic acid, 2-methyloctanoic acid, or 2-ethylnonanoic acid.

11. A method for improving fuel economy in an internal combustion engine, the method comprising supplying to the engine a fuel composition comprising (1) greater than 50 wt. % of a hydrocarbon fuel boiling in gasoline or diesel range and (2) a minor amount of one or more primary or secondary amino alkanediol or an alkyl carboxylic acid salt of the primary or secondary amino alkanediol, wherein the primary or secondary amino alkanediol contains a total of less than 12 carbon atoms.

12. The method of claim 11, wherein structure of the amino alkanediol is



wherein R_1 is an H or an aliphatic group.

13. The method of claim 12, wherein the aliphatic group is one of the following hydrocarbon chain: pentyl group, hexyl group, heptan-2-yl group, octyl group, 2-methylhexyl group, 2-ethylhexyl group, or 4-methylhexyl group.

14. The method of claim 11, wherein the alkyl carboxylic acid salt of the primary or second amino alkanediol includes a carboxylate of an alkyl carboxylic acid.

15. The method of claim 14, wherein the alkyl carboxylic acid is one of the following acids: 2-ethyl hexanoic acid, 2-propyl hexanoic acid, 2-ethyl heptanoic acid or 2-propyl heptanoic acid.

16. The method of claim 11, wherein the amino alkanediol or alkyl carboxylic acid salt of the primary or secondary amino alkanediol is present in about 25 to 5000 ppm by weight.

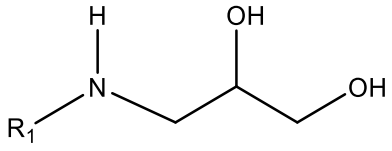
17. The method of claim 11, wherein the fuel composition further comprises:

oxygenate, anti-knock agent, detergent, dispersant, friction modifier, antioxidant, metal deactivator, demulsifier, pour point depressant, flow improver, cetane improver, or lubricity additive.

18. The method of claim 11, wherein alkyl carboxylic acid salt of the primary or secondary amino alkanediol is compositionally limited to the following elements: C, N, O, and H.

19. A lubricating oil composition comprising (1) greater than 50 wt. % of a base oil and (2) a minor amount of one or more primary or secondary amino alkanediol or an alkyl carboxylic acid salt of the primary or secondary amino alkanediol, wherein the primary or secondary amino alkanediol contains a total of less than 12 carbon atoms.

20. The lubricating oil composition of claim 19, wherein structure of the amino alkanediol is



wherein R_1 is an H or an aliphatic group.

21. The lubricating oil composition of claim 20, wherein the aliphatic group is one of the following hydrocarbon chain: pentyl group, hexyl group, heptan-2-yl group, octyl group, 2-methylhexyl group, 2-ethylhexyl group, or 4-methylhexyl group.

22. The lubricating oil composition of claim 19, wherein the alkyl carboxylic acid is one of the following acids: 2-ethyl hexanoic acid, 2-propyl hexanoic acid, 2-ethyl heptanoic acid, 2-propyl heptanoic acid, butyric acid, hexanoic acid, 3-methylhexanoic acid, 2-methyloctanoic acid, or 2-ethylnonanoic acid.

23. The lubricating oil composition of claim 19, wherein the amino alkanediol or the alkyl carboxylic acid salt of the primary or secondary amino alkanediol is present in about 0.001 to 10% by weight.

24. The lubricating oil composition of claim 19, wherein the amino alkanediol or the alkyl carboxylic acid salt of the primary or secondary amino alkanediol is present in about 0.5 to 5% by weight.

25. The lubricating oil composition of claim 19, further comprising:

antioxidant, ashless dispersant, anti-wear agent, detergent, rust inhibitor, dehazing agent, demulsifying agent, friction modifier, metal deactivating agent, pour point depressant, viscosity modifier, antifoaming agent, co-solvent, package compatibilizer, corrosion-inhibitor, dye, or extreme pressure agent.

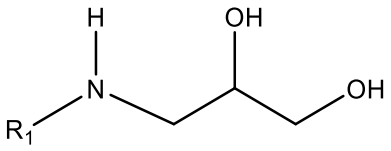
26. The lubricating oil composition of claim 19, wherein the alkyl carboxylic acid salt of the primary or secondary amino alkanediol is compositionally limited to the following elements: C, N, O, and H.

27. A method of improving fuel efficiency of an internal combustion engine, the method comprising:

supplying to the engine a lubricating oil composition comprising (1) greater than 50 wt. % of a base oil and (2) a minor amount of one or more primary or secondary amino alkanediol or an alkyl carboxylic acid salt of the primary or secondary amino alkanediol, wherein the primary or secondary amino alkanediol contains a total of less than 12 carbon atoms.

28. The method of claim 27, wherein the internal combustion engine is spark-ignited.

29. The method of claim 27, wherein structure of the amino alkanediol is



wherein R_1 is an H or an aliphatic group.

30. The method of claim 27, wherein the aliphatic group is one of the following hydrocarbon chain: pentyl group, hexyl group, heptan-2-yl group, octyl group, 2-methylhexyl group, 2-ethylhexyl group, or 4-methylhexyl group.

31. The method of claim 27, wherein the alkyl carboxylic acid is one of the following acids: 2-ethyl hexanoic acid, 2-propyl hexanoic acid, 2-ethyl heptanoic acid or 2-propyl heptanoic acid.