CLAIMS

1. A fuel composition comprising:

a hydrocarbon-based fuel boiling in the gasoline or diesel range;

an amine-based detergent given by formula

$$R_1\text{-}O\text{-}(CH_2)_m\text{-}NHR_2,$$

wherein the amine-based detergent is present in about 10 ppm to about 750 ppm by weight based on total weight of the fuel composition; wherein R_1 is a hydrocarbyl group having 8 to 20 carbons, R_2 is hydrogen or $(CH_2)_nNH_2$ moiety, and wherein m, n are independently integers having a value of 3 or greater; and

one or more nitrogen-containing detergent,

wherein the one or more nitrogen-containing detergent is an aliphatic hydrocarbyl amine, hydrocarbyl-substituted poly(oxyalkylene)amine, hydrocarbyl-substituted succinimide, Mannich reaction product, nitro and amino aromatic ester of polyalkylphenoxyalkanol, or polyalkylphenoxyaminoalkane.

2. The fuel composition of claim 1, wherein R_1 is linear or branched.

3. The fuel composition of claim 1, wherein the amine-based detergent or the one or more nitrogen-containing detergent is a monoamine or a polyamine.

4. The fuel composition of claim 1, wherein the one or more nitrogen-containing detergent is present in about 50 ppm to about 2500 ppm of the fuel composition.

5. The fuel composition of claim 1, further comprising antioxidants, metal deactivators, demulsifiers, oxygenates, antiknock agents, dispersants, pour point depressants, or flow improvers.

6. A concentrate composition comprising:

about 30 to 90 wt % of an organic solvent boiling in a range of from 65°C to 205°C and;

about 10 to 70 wt % of a detergent mixture comprising:

(1) an amine-based detergent given by formula

R_1-O-$(CH_2)_m$-NHR_2,

wherein R_1 is a hydrocarbyl group having 8 to 20 carbons, R_2 is hydrogen or $(CH_2)_nNH_2$ moiety, and wherein m, n are independently integers having a value of 3 or greater; and

(2) one or more nitrogen-containing detergent,

wherein the one or more nitrogen-containing detergent is an aliphatic hydrocarbyl amine, hydrocarbyl-substituted poly(oxyalkylene)amine, hydrocarbyl-substituted succinimide, Mannich reaction product, nitro and amino aromatic ester of polyalkylphenoxyalkanol, or polyalkylphenoxyaminoalkane.

7. The concentrate composition of claim 6, wherein R_1 is linear or branched

8. The concentrate composition of claim 6, wherein the amine-based detergent or the one or more nitrogen-containing detergent is a monoamine or a polyamine.

9. A method of controlling injector fouling, the method comprising:

supplying to a direct injection engine a fuel composition comprising:

a hydrocarbon-based fuel boiling in the gasoline or diesel range;

an amine-based detergent given by formula

R_1-O-$(CH_2)_m$-NHR_2,

wherein the amine-based detergent is present in about 10 ppm to about 750 ppm by weight based on total weight of the fuel composition; wherein R_1 is a hydrocarbyl group having 8 to 20 carbons, R_2 is hydrogen or $(CH_2)_nNH_2$ moiety, and wherein m, n are independently integers having a value of 3 or greater; and

one or more nitrogen-containing detergent.

10. The method of claim 9, wherein R_1 is linear or branched.

11. The method of claim 9, wherein the one or more nitrogen-containing detergent is an aliphatic hydrocarbyl amine, hydrocarbyl-substituted poly(oxyalkylene)amine, hydrocarbyl-substituted succinimide, Mannich reaction product, nitro and amino aromatic ester of polyalkylphenoxyalkanol, or polyalkylphenoxyaminoalkane.

12. The method of claim 9, wherein the amine-based detergent or the one or more nitrogen-containing detergent is a monoamine or a polyamine.

13. The method of claim 9, wherein the one or more nitrogen-containing detergent is present in about 50 ppm to about 2500 ppm of the fuel composition.

14. The method of claim 9, wherein the fuel composition further comprises antioxidants, metal deactivators, demulsifiers, oxygenates, antiknock agents, dispersants, pour point depressants, or flow improvers.