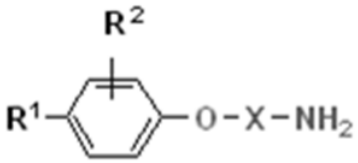
CLAIMS

1. A fuel composition comprising:

gasoline; and

aryloxy alkylamine additive having the following structure:



wherein the aryloxy alkylamine additive is present in 10 to 750 ppm by weight based on total weight of the fuel composition;

wherein X is a hydrocarbyl group having 1 or 2 carbon atoms; and

wherein R^1 and R^2 are independently hydrogen or hydrocarbyl group having up to 36 carbon atoms.

2. The fuel composition of claim 1, wherein X is ethylene group.

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

a nitrogen-containing detergent, optionally wherein the 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.

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

5. The fuel composition of claim 1, wherein the aryloxy alkylamine is 2-(4-dodecylphenoxy)ethyl-1-amine, 2-(phenoxy)ethyl-1-amine, 2-(4-butylphenoxy)ethyl-1-amine, 2-(4-octylphenoxy)ethyl-1-amine, 2-(4-nonylphenoxy)ethyl-1-amine, 2-(4-

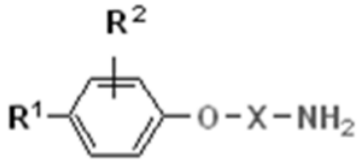
octadecylphenoxy)ethyl-1-amine, 2-(4-eicosanylphenoxy)ethyl-1-ami ne, 2-(4-docosanylphenoxy)ethyl-1-amine, or 2-(4-tetracosanylphenoxy)ethyl-1-amine.

6. A concentrate composition comprising:

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

10 to 70 wt % of a fuel additive comprising:

an aryloxy alkylamine given by formula



wherein X is a hydrocarbyl group having 1 or 2 carbon atoms; and

wherein R^1 and R^2 are independently hydrogen or hydrocarbyl group having up to 36 carbon atoms.

7. The concentrate composition of claim 6, wherein X is ethylene group.

8. The concentrate composition of claim 6, further comprising:

a nitrogen-containing detergent, optionally wherein the 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.

9. The concentrate composition of claim 6, wherein at least one of R^1 and R^2 is hydrogen.

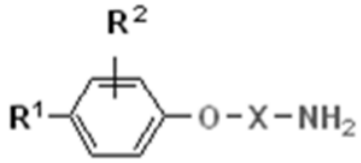
10. The concentrate composition of claim 6, wherein the aryloxy alkylamine is 2-(4-dodecylphenoxy)ethyl-1-amine, 2-(phenoxy)ethyl-1-amine, 2-(4-butylphenoxy)ethyl-

1-amine, 2-(4-octylphenoxy)ethyl-1-amine, 2-(4-nonylphenoxy)ethyl-1-amine, 2-(4-octadecylphenoxy)ethyl-1-amine, 2-(4-eicosanylphenoxy)ethyl-1-ami ne, 2-(4-docosanylphenoxy)ethyl-1-amine, or 2-(4-tetracosanylphenoxy)ethyl-1-amine.

11. A method of reducing injector fouling in a direct injection spark ignition gasoline engine comprising:

providing a gasoline composition comprising:

aryloxy alkylamine additive having the following structure



wherein the aryloxy alkylamine additive is present in 10 to 750 ppm by weight based on total weight of the fuel composition;

wherein X is a hydrocarbyl group having 1 or 2 carbon atoms; and

wherein R^1 and R^2 are independently hydrogen, alkyl or alkenyl group having up to 36 carbon atoms.

12. The method of claim 11, wherein X is ethylene group.

13. The method of claim 11, further comprising:

a nitrogen-containing detergent, optionally wherein the 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.

14. The method of claim 13, further comprising antioxidants, metal deactivators, demulsifiers, oxygenates, antiknock agents, dispersants, pour point depressants, or flow improvers.

15. The method of claim 11, wherein the aryloxy alkylamine is 2-(4-dodecylphenoxy)ethyl-1-amine, 2-(phenoxy)ethyl-1-amine, 2-(4-butylphenoxy)ethyl-1-amine, 2-(4-octylphenoxy)ethyl-1-amine, 2-(4-nonylphenoxy)ethyl-1-amine, 2-(4-octadecylphenoxy)ethyl-1-amine, 2-(4-eicosanylphenoxy)ethyl-1-ami ne, 2-(4-docosanylphenoxy)ethyl-1-amine, or 2-(4-tetracosanylphenoxy)ethyl-1-amine.