3892-01-WO

We claim:

1. A lubricating composition comprising:

(a) an oil of lubricating viscosity;

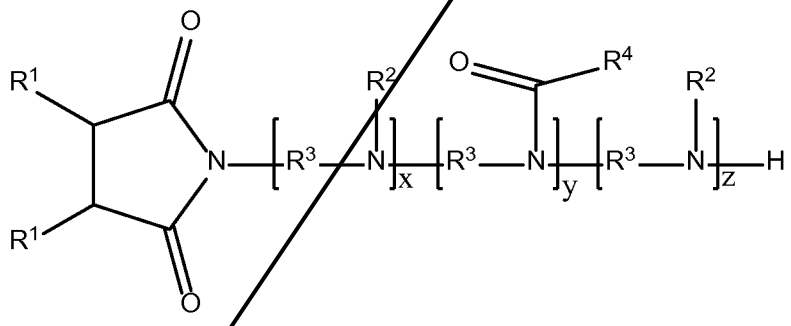
(b) an asphaltene dispersant comprising an amide group; and

(c) a detergent derived from an alkyl phenol.

2. The composition of claim 1 wherein the asphaltene dispersant is substantially free of cyclic headgroup that contains a nitrogen atom.

3. The composition of any of the claims 1 to 2 wherein the asphaltene dispersant comprises:

(i) a compound represented by formula (I);



(I)

wherein each $R^1$ is independently a hydrogen or a hydrocarbyl group containing 1 to 250 carbon atoms, so long as at least one R1 is a hydrocarbyl group;

each $R^2$ is independently a hydrogen or a hydrocarbyl group containing 1 to 10 carbon atoms;

each $R^3$ is independently a hydrocarbylene group containing from 1 to 10 carbon atoms;

each $R^4$ is independently a hydrocarbyl group containing from 1 to 50 carbon atoms;

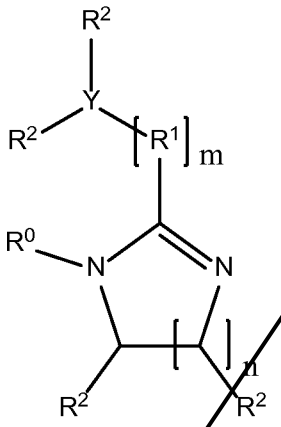
x is an integer from 0 to 6;

y is an integer from 1 to 4; and

z is an integer from 0 to 6;

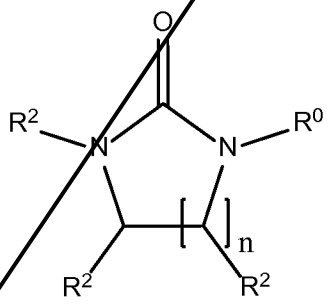
4. The composition of claim 3 wherein the asphaltene dispersant further comprises:

(i) a compound represented by formula (II);



(II)

(ii) a compound represented by formula (III);

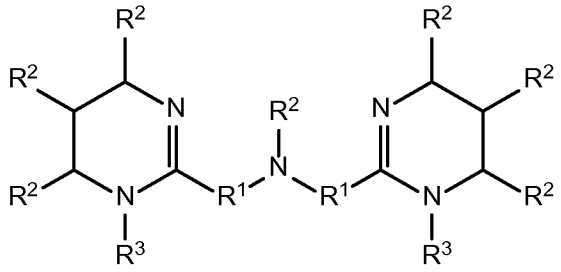


(III)

wherein, for formulas (II) and (III) above, each $R^0$ is independently a hydrogen or a hydrocarbyl group containing 1 to 250 carbon atoms; each $R^1$ is independently a hydrocarbyl group comprising 1 to 10 carbon atoms; each $R^2$ is independently hydrogen, a hydroxy group, or a hydrocarbyl group comprising 1 to 50 carbon atoms; Y is a carbon atom or a nitrogen atom; n is 1 or 2; and m is 0 or 1.

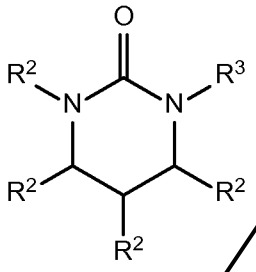
5. The composition of any of the claims 3 to 4 wherein the asphaltene dispersant further comprises:

(i) a compound represented by formula (IV);



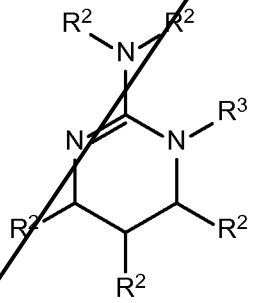
(IV)

(ii) a compound represented by formula (V);



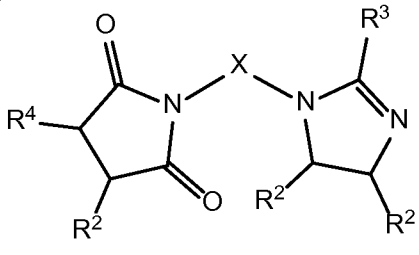
(V)

(iii) a compound represented by formula (VI);



(VI)

(iv) a compound represented by formula (VII); or



(VII)

(v) combinations thereof;

wherein, for formulas (IV), (V), (VI) and (VII), each $R^1$ is independently a hydrocarbyl group comprising 1 to 10 carbon atoms; each $R^2$ is independently hydrogen or a hydrocarbyl group comprising 1 to 50 carbon atoms; each $R^3$ is independently a hydrocarbyl group comprising 1 to 50 carbon atoms; $R^4$ is a hydrocarbyl group containing 1 to 200 carbon atoms; and X is a hydrocarbylene

group derived from an amine or a polyamine comprising 1 to 20 carbon atoms and 1 to 5 nitrogen atoms.

6. The composition of claim 4 wherein: $R^2$ is monounsaturated; or $R^4$ is derived from polyisobutylene; or X is derived from a polyalkylene polyamine; or combinations thereof.

7. The composition of any of the claims 1 to 6 wherein the alkyl phenol detergent is present at 1 percent by weight or more in the overall composition.

8. The composition of any of the claims 1 to 7 wherein the alkyl phenol detergent comprises a calcium phenate sulfide.

9. The composition of any of the claims 1 to 8 wherein the total base number of the composition is at least 25 wherein at least 50 percent of the base number of the overall composition is delivered by the phenate detergent

10. The composition of any of the claims 1 to 9 further comprising (d) a salicylate detergent wherein not more than 50 percent the TBN of the overall composition is delivered from the salicylate detergent.

11. The composition of any of the claims 1 to 10 wherein the composition is a marine diesel engine lubricant or a power station combustion engine lubricant.

12. A method of lubricating an internal combustion engine comprising supplying the lubricating composition of claim 1 to an engine.

13. The method of claim 12 wherein the internal combustion engine is a marine diesel engine or a power station combustion engine.

14. The method of claim 13 wherein the marine diesel engine is a 4-stroke trunk piston engine; or wherein the marine diesel engine is a 2-stroke cross-head engine and the lubricating composition is a system oil.

15. A process of preparing an asphaltene dispersant comprising the steps of reacting (i) a substantially linear succinimide dispersant that contains at least two nitrogen atoms where the nitrogen atoms are separated by two or three carbon atoms with (ii) a carboxylic acid, resulting in an asphaltene dispersant comprising an amide group.

16. The process of claim 15 wherein said reaction may also produce asphaltene dispersants where the compound reacts with itself to form a ring structure containing the two said nitrogen atoms, such that the resulting dispersant comprises an asphaltene dispersant comprising an amide group and an asphaltene dispersant comprising a cyclic headgroup wherein said headgroup contains two nitrogen atoms.

We claim:

1. A lubricating composition comprising:

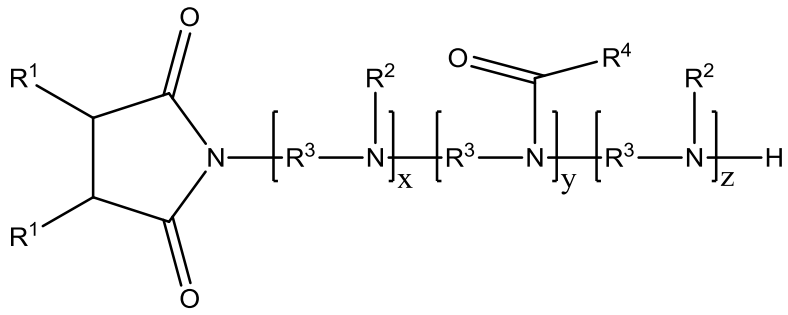
(a) an oil of lubricating viscosity;

(b) an asphaltene dispersant comprising an amide group; and

(c) a detergent derived from an alkyl phenol;

wherein the asphaltene dispersant comprises:

(i) a compound represented by formula (I);



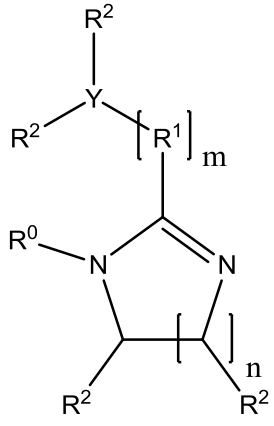
(I)

wherein each $R^1$ is independently a hydrogen or a hydrocarbyl group containing 1 to 250 carbon atoms, so long as at least one R1 is a hydrocarbyl group; each $R^2$ is independently a hydrogen or a hydrocarbyl group containing 1 to 10 carbon atoms; each $R^3$ is independently a hydrocarbylene group containing from 1 to 10 carbon atoms; each $R^4$ is independently a hydrocarbyl group containing from 1 to 50 carbon atoms; x is an integer from 0 to 6; y is an integer from 1 to 4; and z is an integer from 0 to 6.

2. The composition of claim 1 wherein the asphaltene dispersant is substantially free of cyclic headgroup that contains a nitrogen atom.

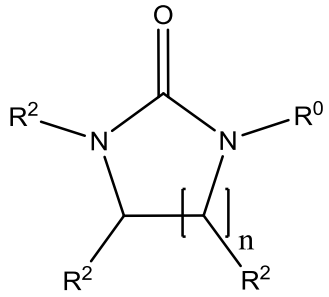
3.. The composition of claim 1 wherein the asphaltene dispersant further comprises:

(i) a compound represented by formula (II);



(II)

(ii) a compound represented by formula (III);

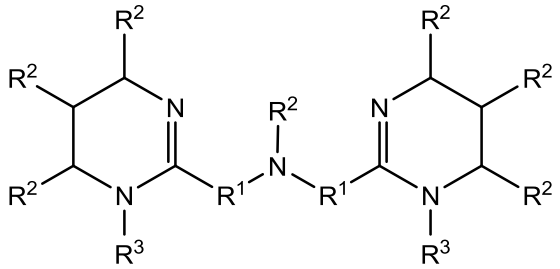


(III)

wherein, for formulas (II) and (III) above, each $R^0$ is independently a hydrogen or a hydrocarbyl group containing 1 to 250 carbon atoms; each $R^1$ is independently a hydrocarbyl group comprising 1 to 10 carbon atoms; each $R^2$ is independently hydrogen, a hydroxy group, or a hydrocarbyl group comprising 1 to 50 carbon atoms; Y is a carbon atom or a nitrogen atom; n is 1 or 2; and m is 0 or 1.

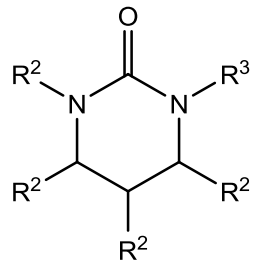
4. The composition of claim 1 wherein the asphaltene dispersant further comprises:

(i) a compound represented by formula (IV);



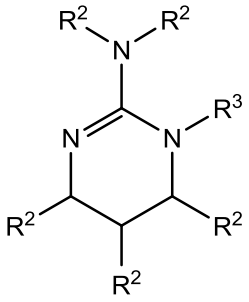
(IV)

(ii) a compound represented by formula (V);



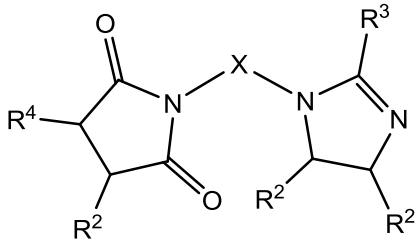

(V)

(iii) a compound represented by formula (VI);




(VI)

(iv) a compound represented by formula (VII); or




(VII)

(v) combinations thereof;

wherein, for formulas (IV), (V), (VI) and (VII), each $R^1$ is independently a hydrocarbyl group comprising 1 to 10 carbon atoms; each $R^2$ is independently hydrogen or a hydrocarbyl group comprising 1 to 50 carbon atoms; each $R^3$ is independently a hydrocarbyl group comprising 1 to 50 carbon atoms; $R^4$ is a hydrocarbyl group containing 1 to 200 carbon atoms; and X is a hydrocarbylene group derived from an amine or a polyamine comprising 1 to 20 carbon atoms and 1 to 5 nitrogen atoms.

5. The composition of claim 4 wherein: $R^2$ is monounsaturated; or $R^4$ is derived from polyisobutylene; or X is derived from a polyalkylene polyamine; or combinations thereof.

6. The composition of claim 1 wherein the alkyl phenol detergent is present at 1 percent by weight or more in the overall composition.

7. The composition of claim 1 wherein the alkyl phenol detergent comprises a calcium phenate sulfide.

8. The composition of claim 1 wherein the total base number of the composition is at least 25 wherein at least 50 percent of the base number of the overall composition is delivered by the phenate detergent

9. The composition of claim 1 further comprising (d) a salicylate detergent wherein not more than 50 percent the TBN of the overall composition is delivered from the salicylate detergent.

10. The composition of claim 1 wherein the composition is a marine diesel engine lubricant or a power station combustion engine lubricant.

11. A method of lubricating an internal combustion engine comprising supplying the lubricating composition of claim 1 to an engine.

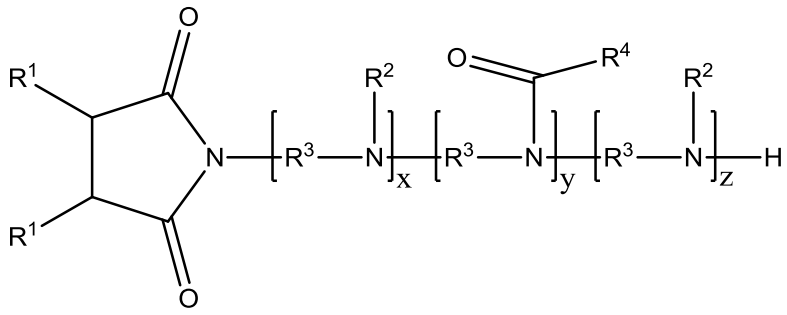
12. The method of claim 11 wherein the internal combustion engine is a marine diesel engine or a power station combustion engine.

13. The method of claim 12 wherein the marine diesel engine is a 4-stroke trunk piston engine; or wherein the marine diesel engine is a 2-stroke cross-head engine and the lubricating composition is a system oil.

14. A process of preparing an asphaltene dispersant comprising the steps of reacting (i) a substantially linear succinimide dispersant that contains at least two nitrogen atoms where the nitrogen atoms are separated by two or three carbon atoms with (ii) a carboxylic acid, resulting in an asphaltene dispersant comprising an amide group;

wherein the asphaltene dispersant comprises:

(i) a compound represented by formula (I);



(I)

wherein each $R^1$ is independently a hydrogen or a hydrocarbyl group containing 1 to 250 carbon atoms, so long as at least one R1 is a hydrocarbyl group; each $R^2$ is independently a hydrogen or a hydrocarbyl group containing 1 to 10 carbon atoms; each $R^3$ is independently a hydrocarbylene group containing from 1 to 10 carbon atoms; each $R^4$ is independently a hydrocarbyl group containing from 1 to 50 carbon atoms; x is an integer from 0 to 6; y is an integer from 1 to 4; and z is an integer from 0 to 6.