

CLAIMS

1. A lubricating oil composition comprising:
a base oil;
a primary antioxidant comprising alkylated diphenylamines having an alkyl group derived from a propylene tetramer;
and
a carboxylate detergent.
2. The lubricating oil composition of claim 1, further comprising:
a secondary antioxidant comprising a dithiocarbamate, a hindered phenol, or a molybdenum succinimide.
3. The lubricating oil composition of claim 1, wherein at least 50% of the alkyl group of the alkylated diphenylamine have a carbon number between 10 and 15 .
4. The lubricating oil composition of claim 1, wherein the carboxylate detergent is an aromatic carboxylate or an aliphatic carboxylate.
5. The lubricating oil composition of claim 1, wherein the carboxylate detergent is a salicylate, a naphthenate, or a stearate.
6. The lubricating oil composition of claim 1, wherein the primary antioxidant is present in 0.4 wt % to 20 wt % of the lubricating oil composition.
7. The lubricating oil composition of claim 1, wherein the carboxylate detergent is low overbased, medium overbased, high overbased or high high overbased.
8. The lubricating oil of claim 1, wherein the secondary antioxidant is present in 0.01 wt % to 20 wt % of the lubricating oil composition.

9. The lubricating oil composition of claim 1, wherein the carboxylate detergent is present in 0.01 wt % to 10 wt % of the lubricating oil composition.
10. The lubricating oil composition of claim 1, further comprising:
an antioxidant, an ashless dispersant, an anti-wear agent, a detergent, a rust inhibitor, a dehazing agent, a demulsifying agent, a friction modifier, a metal deactivating agent, a pour point depressant, a viscosity modifier, an antifoaming agent, a co-solvent, a package compatibilizer, a corrosion-inhibitor, a dye, or an extreme pressure agent.
11. A method of improving oxidation stability of a lubricating oil, the method comprising:
supplying to an engine a lubricating oil composition comprising:
a major amount of a base oil; and
a primary antioxidant comprising alkylated diphenylamines having an alkyl group comprising a propylene tetramer;
a carboxylate detergent.
12. The method of claim 11, wherein the lubricating oil composition further comprises:
a secondary antioxidant comprising a dithiocarbamate, a hindered phenol, or a molybdenum succinimide.
13. The method of claim 11, wherein at least 50% of the alkyl group of the alkylated diphenylamine have a carbon number between 10 and 15.
14. The method of claim 11, wherein the carboxylate detergent is an aromatic carboxylate or an aliphatic carboxylate.

15. The method of claim 11, wherein the carboxylate detergent is a salicylate, a naphthenate, or a stearate.
16. The method of claim 11, wherein the primary antioxidant is present in 0.4 wt % to 20 wt % of the lubricating oil composition.
17. The method of claim 11, wherein the carboxylate detergent is low overbased, medium overbased, high overbased or high high overbased.
18. The method of claim 11, wherein the secondary antioxidant is present in 0.01 wt % to 20 wt % of the lubricating oil composition.
19. The method of claim 11, wherein the carboxylate detergent is present in 0.01 wt % to 10 wt % of the lubricating oil composition.
20. The method of claim 11, wherein the lubricating oil composition further comprises:
an antioxidant, an ashless dispersant, an anti-wear agent, a detergent, a rust inhibitor, a dehazing agent, a demulsifying agent, a friction modifier, a metal deactivating agent, a pour point depressant, a viscosity modifier, an antifoaming agent, a co-solvent, a package compatibilizer, a corrosion-inhibitor, a dye, or an extreme pressure agent.