Yasushi, JP2005320441 teaches the use of a mixed borate ester of bis-ethoxylated alkyl amides and glycerol monoesters in low sulfur formulations as antiwear additives.

None of the lubricants previously described address the problem of friction modification in a diesel engine oil with an alkylated ether alcohol that is co-borated with hydrocarbyl polyol having at least two hydroxyl groups.

SUMMARY OF THE ~~INVENTION~~DISCLOSURE

An embodiment of the present ~~invention~~ disclosure is directed to a lubricating oil additive composition comprising the reaction product of an (a) an alkylated aromatic ether alcohol, (b) a source of boron, and (c) a hydrocarbyl polyol, having at least two hydroxyl groups.

An embodiment of the present ~~invention~~ disclosure is directed to a lubricating oil composition comprising A. major amount of an oil of lubricating viscosity and B. a lubricating oil additive composition comprising the reaction product of (i) an alkylated aromatic ether alcohol, (ii) a source of boron, and (iii) a hydrocarbyl polyol, having at least three hydroxyl groups.

An embodiment of the present ~~invention~~ disclosure is directed to a method for reducing friction in an internal combustion engine comprising lubricating said engine with a lubricating oil composition comprising the lubricating oil composition comprising (A) major amount of an oil of lubricating viscosity and (B) a lubricating oil additive composition comprising the reaction product of (i) an alkylated aromatic ether alcohol, (ii) a source of boron, and (iii) a hydrocarbyl polyol, having at least three hydroxyl groups.

An embodiment of the present ~~invention~~ disclosure is directed to a lubricating oil additive concentrate comprising from about 90 wt. % to about 10 wt. % of an organic liquid diluent and from about 10 wt. % to about 90 wt. % of the lubricating oil additive composition comprising the reaction product of an (a) an alkylated aromatic ether alcohol, (b) a source of boron, and (c) a hydrocarbyl polyol, having at least two hydroxyl groups.

An embodiment of the present ~~invention~~ disclosure is directed to a method of preparing a lubricating oil additive composition comprising reacting (a) an alkylated aromatic ether alcohol, (b) a source of boron, and (c) a hydrocarbyl polyol, having at least three hydroxyl groups.

In one aspect, there is provided a lubricating oil additive composition comprising the reaction product of

(a) an alkylated aromatic ether alcohol,

(b) a source of boron, and

(c) an alkyl polyol, having at least two hydroxyl groups.

In one aspect, there is provided a lubricating oil composition comprising

A. major amount of an oil of lubricating viscosity and

B. a lubricating oil additive composition comprising the reaction product of

(i) an alkylated aromatic ether alcohol,

(ii) a source of boron, and

(iii) an alkyl polyol, having at least three hydroxyl groups.

In one aspect, there is provided a method for reducing friction in an internal combustion engine comprising lubricating said engine with a lubricating oil composition comprising the lubricating oil composition comprising A. major amount of an oil of lubricating viscosity and B. a lubricating oil additive composition comprising the reaction product of (i) an alkylated aromatic ether alcohol, (ii) a source of boron, and (iii) an alkyl polyol, having at least three hydroxyl groups.

In one aspect, there is provided a lubricating oil additive concentrate comprising from 90 wt. % to 10 wt. % of an organic liquid diluent and from 10 wt. % to 90 wt. % of the lubricating oil additive composition comprising the reaction product of (a) an alkylated aromatic ether alcohol, (b) a source of boron, and (c) an alkyl polyol, having at least two hydroxyl groups.

In one aspect, there is provided a method of preparing a lubricating oil additive composition comprising reacting

(a) an alkylated aromatic ether alcohol,

(b) a source of boron, and

(c) an alkyl polyol, having at least three hydroxyl groups.

WHAT IS CLAIMED IS:

1. A lubricating oil additive composition comprising the reaction product of ~~an~~

(a) an alkylated aromatic ether alcohol,

(b) a source of boron, and

(c) ~~a hydrocarbyl~~an alkyl polyol, having at least two hydroxyl groups.

2. The lubricating oil additive composition of Claim 1 wherein the alkyl group in the alkylated aromatic ether alcohol has from ~~about~~ 2 to ~~about~~ 40 carbon atoms.

3. The lubricating oil additive composition of Claim 2 wherein the alkyl group in the alkylated ether alcohol has from ~~about~~ 2 to ~~about~~ 12 carbon atoms.

4. The lubricating oil additive composition of Claim 1 wherein the alkylated aromatic ether alcohol is ~~diisobutylether phenol, nonyl ether phenol or~~ dodecyl resorcinol ether alcohol.

5. The lubricating oil additive composition of Claim 1 wherein the source of boron is boric acid.

6. The lubricating oil additive composition of Claim 1 wherein the ~~hydrocarbyl~~ alkyl polyol is glycerol, diglycerol or pentaerythritol.

7. The lubricating oil additive composition of Claim 1 wherein the ratio of the alkylated aromatic ether alcohol, the source of boron and the ~~hydrocarbyl~~ alkyl polyol is from ~~about~~ 1:0.2:0.2 to 1:3:3, respectively.

8. A lubricating oil composition comprising

A. major amount of an oil of lubricating viscosity and

B. a lubricating oil additive composition comprising the reaction product of

(i) an alkylated aromatic ether alcohol,

(ii) a source of boron, and

(iii) ~~a hydrocarbyl~~an alkyl polyol, having at least three hydroxyl groups.

9. The lubricating oil additive composition of Claim 8 wherein the alkyl group in the alkylated aromatic ether alcohol has from ~~about~~ 2 to ~~about~~ 40 carbon atoms.

10. The lubricating oil ~~additive~~ composition of Claim 9 wherein the alkyl group in the alkylated aromatic ether alcohol has from ~~about~~ 2 to ~~about~~ 12 carbon atoms.

11. The lubricating oil ~~additive~~ composition of Claim 1 wherein the alkylated aromatic ether alcohol is ~~diisobutylether phenol, nonyl ether phenol or~~ dodecyl resorcinol ether alcohol.

12. The lubricating oil composition of Claim 8 wherein the source of boron is boric acid.

13. The lubricating oil composition of Claim 8 wherein the ~~hydrocarbyl~~ alkyl polyol is glycerol, diglycerol or pentaerythritol.

14. A method for reducing friction in an internal combustion engine comprising lubricating said engine with a lubricating oil composition comprising the lubricating oil composition ~~in~~ of Claim 8.

15. A lubricating oil additive concentrate comprising from ~~about~~ 90 wt. % to ~~about~~ 10 wt. % of an organic liquid diluent and from ~~about~~ 10 wt. % to ~~about~~ 90 wt. % of the lubricating oil additive composition of Claim 1.

16. A method of preparing a lubricating oil additive composition comprising reacting

(a) an alkylated aromatic ether alcohol,

(b) a source of boron, and

(c) ~~a hydrocarbyl~~an alkyl polyol, having at least three hydroxyl groups.

17. The method of Claim 16 wherein the ratio of the alkylated aromatic ether alcohol, the source of boron and the ~~hydrocarbyl~~ alkyl polyol is from ~~about~~ 1:0.2:0.2 to 1:3:3, respectively.

18. The method of Claim 16 wherein the alkyl group in the alkylated aromatic ether alcohol has from ~~about~~ 2 to ~~about~~ 40 carbon atoms.

19. The method of Claim 18 wherein the alkyl group in the alkylated aromatic ether alcohol has from ~~about~~ 2 to ~~about~~ 12 carbon atoms.

20. The method of Claim 16 wherein the alkylated aromatic ether alcohol is ~~diisobutylether phenol, nonyl ether phenol or~~ dodecyl resorcinol ether alcohol.

21. The method of Claim 16 wherein the source of boron is boric acid.

22. The method of Claim 16 wherein the ~~hydrocarbyl~~ alkyl polyol is glycerol, diglycerol or pentaerythritol.