CLAIMS:

1. A method for improving wear control in an engine or other mechanical component lubricated with a lubricating oil by

providing a lubricating oil as a formulated oil to an engine or other mechanical component, said formulated oil having a composition comprising a lubricating oil base stock as a major component; and encapsulated boron-containing microscale particles, as a minor component; wherein the encapsulated boron-containing microscale particles comprise an encapsulating material and a boron-containing compound encapsulated by the encapsulating material; wherein the boron-containing compound is a boron oxide, a boric acid, or mixtures thereof; wherein the encapsulating material is a carboxylic acid selected from the group consisting of an aliphatic carboxylic acid, a cycloaliphatic carboxylic acid, an aromatic carboxylic acid, and mixtures thereof;

measuring wear control of the engine or other mechanical component lubricated with the lubricating oil; and

wherein wear control is improved as compared to wear control achieved using a lubricating oil containing a minor component other than the encapsulated boron-containing microscale particles,

wherein other mechanical component is selected from the group consisting of a power train, a driveline, a transmission, a gear, a gear train, a gear set, a compressor, a pump, a hydraulic system, a bearing, a bushing, a turbine, a piston, a piston ring, a cylinder liner, a cylinder, a cam, a tappet, a lifter, a gear, a valve, or a bearing including a journal, a roller, a tapered, a needle, and a ball bearing.

2. The method of claim 1 wherein wear control is improved and friction reduction is maintained or improved as compared to wear control and friction reduction achieved using a lubricating oil containing a minor component other than the encapsulated boron-containing microscale particles.

3. The method of claim 1 wherein the lubricating oil base stock comprises a Group I, Group II, Group III, Group IV or Group V base oil.

4. The method of claim 1 wherein the boron-containing compound is a boron oxide selected from boron trioxide (B_2O_3), boron monoxide (B_2O), and boron suboxide (B_6O).

5. The method of claim 1 wherein the boron-containing compound is boron trioxide (B_2O_3).

6. The method of claim 1 wherein the carboxylic acid is an aliphatic, saturated, unbranched carboxylic acid having from 8 to 26 carbon atoms, and mixtures thereof.

7. The method of claim 1 wherein the carboxylic acid is selected from the group consisting of caprylic acid (C8), pelargonic acid (C9), capric acid (C10), undecylic acid (C11), lauric acid (C12), tridecylic acid (C13), myristic acid (C14), pentadecylic acid (C15), palmitic acid (C16), margaric acid (C17), stearic acid (C18), isostearic acid (C18), nonadecylic acid (C19), arachidic acid (C20), heneicosylic acid (C21), behenic acid (C22), tricosylic acid (C23), lignoceric acid (C24), pentacosylic acid (C25), cerotic acid (C26), and mixtures thereof.

8. The method of claim 1 wherein the encapsulated boron-containing microscale particles have an encapsulating shell layer thickness of less than 100 nm.

9. The method of claim 1 wherein the encapsulated boron-containing microscale particles have an average particle diameter as measured by transmission electron microscopy (TEM) imaging, from 10 nm to 5 microns.

10. The method of claim 1 wherein the encapsulated microscale particles comprise encapsulated nanoscale particles.

11. The method of claim 1 wherein the encapsulated boron-containing microscale particles comprise at least one of the following:

oleic acid encapsulated B_2O_3 microscale particles,

stearic acid encapsulated B_2O_3 microscale particles,

stearic acid/oleic acid encapsulated B_2O_3 microscale particles,

palmitic acid encapsulated B_2O_3 microscale particles,
palmitic/oleic acid encapsulated B_2O_3 microscale particles,
palmitic/ stearic acid encapsulated B_2O_3 microscale particles,
naphthenic acid encapsulated B_2O_3 microscale particles,
naphthenic/stearic acid encapsulated B_2O_3 microscale particles, and
naphthenic/oleic acid encapsulated B_2O_3 microscale particles.

12. The method of claim 1 wherein the encapsulated boron-containing microscale particles are present in an amount of from 0.01 weight percent to 6 weight percent, based on the total weight of the formulated oil.

13. The method of claim 1 wherein the lubricating oil base stock is present in an amount of from 70 weight percent to 95 weight percent, based on the total weight of the formulated oil.

14. The method of claim 1 wherein the formulated oil further comprises one or more of an antiwear additive, viscosity modifier, antioxidant, detergent, dispersant, pour point depressant, corrosion inhibitor, metal deactivator, seal compatibility additive, anti-foam agent, inhibitor, and anti-rust additive.

15. A lubricating oil having a composition comprising a lubricating oil base stock as a major component; and encapsulated boron-containing microscale particles, as a minor component; wherein the encapsulated boron-containing microscale particles comprise an encapsulating material and a boron-containing compound encapsulated by the encapsulating material; wherein the boron-containing compound is a boron oxide, a boric acid, or mixtures thereof; wherein the encapsulating material is a carboxylic acid selected from the group consisting of an aliphatic carboxylic acid, a cycloaliphatic carboxylic acid, an aromatic carboxylic acid, and mixtures thereof; and wherein wear control is improved as compared to wear control achieved using a lubricating oil containing a minor component other than the encapsulated boron-containing microscale particles.

16. The lubricating oil of claim 15 wherein wear control is improved and friction reduction is maintained or improved as compared to wear control and friction reduction achieved using a lubricating oil containing a minor component other than the encapsulated boron-containing microscale particles.

17. The lubricating oil of claim 15 wherein the lubricating oil base stock comprises a Group I, Group II, Group III, Group IV or Group V base oil.

18. The lubricating oil of claim 15 wherein the boron-containing compound is a boron oxide selected from boron trioxide (B_2O_3), boron monoxide (B_2O), and boron suboxide (B_6O).

19. The lubricating oil of claim 15 wherein the boron-containing compound is boron trioxide (B_2O_3).

20. The lubricating oil of claim 15 wherein the carboxylic acid is an aliphatic, saturated, unbranched carboxylic acid having from 8 to 26 carbon atoms, and mixtures thereof.

21. The lubricating oil of claim 15 wherein the carboxylic acid is selected from the group consisting of caprylic acid (C8), pelargonic acid (C9), capric acid (C10), undecylic acid (C11), lauric acid (C12), tridecylic acid (C13), myristic acid (C14), pentadecylic acid (C15), palmitic acid (C16), margaric acid (C17), stearic acid (C18), isostearic acid (C18), nonadecylic acid (C19), arachidic acid (C20), heneicosylic acid (C21), behenic acid (C22), tricosylic acid (C23), lignoceric acid (C24), pentacosylic acid (C25), cerotic acid (C26), and mixtures thereof.

22. The lubricating oil of claim 15 wherein the encapsulated boron-containing microscale particles have an encapsulating shell layer thickness of less than 100 nm.

23. The lubricating oil of claim 15 wherein the encapsulated boron-containing microscale particles have an average particle diameter as measured by transmission electron microscopy (TEM) imaging, from 10 nm to 5 microns.

24. The lubricating oil of claim 15 wherein the encapsulated microscale particles comprise encapsulated nanoscale particles.

25. The lubricating oil of claim 15 wherein the encapsulated boron-containing microscale particles comprise at least one of the following:

oleic acid encapsulated B_2O_3 microscale particles,
stearic acid encapsulated B_2O_3 microscale particles,
stearic acid/oleic acid encapsulated B_2O_3 microscale particles,
palmitic acid encapsulated B_2O_3 microscale particles,
palmitic/oleic acid encapsulated B_2O_3 microscale particles,
palmitic/ stearic acid encapsulated B_2O_3 microscale particles,
naphthenic acid encapsulated B_2O_3 microscale particles,
naphthenic/stearic acid encapsulated B_2O_3 microscale particles, and
naphthenic/oleic acid encapsulated B_2O_3 microscale particles.

26. The lubricating oil of claim 15 wherein the encapsulated boron-containing microscale particles are present in an amount of from 0.01 weight percent to 6 weight percent, based on the total weight of the formulated oil.

27. The lubricating oil of claim 15 wherein the lubricating oil base stock is present in an amount of from 70 weight percent to 95 weight percent, based on the total weight of the formulated oil.

28. The lubricating oil of claim 15 wherein the formulated oil further comprises one or more of an antiwear additive, viscosity modifiers, antioxidant, detergent, dispersant, pour point depressant, corrosion inhibitor, metal deactivator, seal compatibility additive, anti-foam agent, inhibitor, and anti-rust additive.

29. The lubricating oil of claim 15 which is a passenger vehicle engine oil (PVEO).

30. The lubricating oil of claim 15 which is an engine lubricating oil or a mechanical component lubricating oil.

31. The method of claim 1 wherein the formulated oil further comprises an antiwear additive, wherein the antiwear additive comprises zinc dialkyl dithio phosphate (ZDDP).

32. The method of claim 31 wherein the ZDDP is present in an amount less than 0.8 weight percent to 0.4 weight percent, based on the total weight of the lubricating oil.

33. The method of claim 31 wherein the ZDDP is present in an amount of 0.6 to 0.2 weight percent, based on the total weight of the lubricating oil.

34. The lubricating oil of claim 15 further comprising an antiwear additive, wherein the antiwear additive comprises zinc dialkyl dithio phosphate (ZDDP).

35. The lubricating oil of claim 34 wherein the ZDDP is present in an amount less than 0.8 weight percent to 0.4 weight percent, based on the total weight of the lubricating oil.

36. The lubricating oil of claim 34 wherein the ZDDP is present in an amount of 0.6 to 0.2 weight percent, based on the total weight of the lubricating oil.

37. A method for improving friction control in an engine or other mechanical component lubricated with a lubricating oil by

providing a lubricating oil as a formulated oil to an engine or other mechanical component, said formulated oil having a composition comprising a lubricating oil base stock as a major component; and encapsulated boron-containing microscale particles, as a minor component; wherein the encapsulated boron-containing microscale particles comprise an encapsulating material and a boron-containing compound encapsulated by the encapsulating material; wherein the boron-containing compound is a boron oxide, a boric acid, or mixtures thereof; wherein the

encapsulating material is a carboxylic acid selected from the group consisting of an aliphatic carboxylic acid, a cycloaliphatic carboxylic acid, an aromatic carboxylic acid, and mixtures thereof;

measuring friction control of the engine or other mechanical component lubricated with the lubricating oil;

and wherein friction control is improved as compared to friction control achieved using a lubricating oil containing a minor component other than the encapsulated microscale particles,

wherein other mechanical component is selected from the group consisting of a power train, a driveline, a transmission, a gear, a gear train, a gear set, a compressor, a pump, a hydraulic system, a bearing, a bushing, a turbine, a piston, a piston ring, a cylinder liner, a cylinder, a cam, a tappet, a lifter, a gear, a valve, or a bearing including a journal, a roller, a tapered, a needle, and a ball bearing.