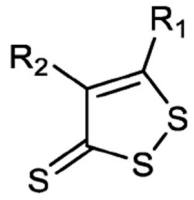
CLAIMS

1. A lubricating oil composition for an automotive vehicle with an electric motor and/or generator, comprising:

a. a major amount of an oil of lubricating viscosity having a kinematic viscosity at 100°C in a range of 1.5 mm^2/s to 20 mm^2/s;

b. a sulfur-based additive including a thiadiazole and a sulfurized polyolefin of formula (I):



(I)

where R_1 is hydrogen or methyl, and R_2 is a C8-C40 hydrocarbyl group, the sulfur-based additive providing sulfur to the lubricating oil composition in an amount of 0.01 wt. % to 0.2 wt. %, based on the total weight of the lubricating oil composition;

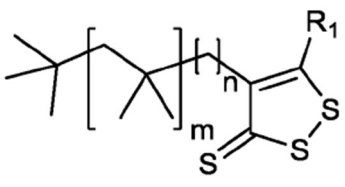
c. a phosphorus compound; and

d. an ashless polyisobutenyl succinimide-based dispersant containing boron.

2. The lubricating oil composition of claim 1 including a triazole-containing corrosion inhibitor.

3. The lubricating oil composition of claim 1, wherein the oil of lubricating viscosity includes a Group II base stock and a Group III base stock.

4. The lubricating oil composition of claim 1, wherein the sulfurized polyolefin of formula I is a sulfurized polyisobutylene oligomer of formula II:

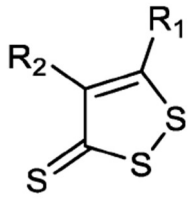


(II)

wherein R1 is hydrogen or methyl, m is an integer from 1 to 9, and n is 0 or 1.

5. A method of reducing corrosion and improving wear protection in the transmission system of an automotive vehicle with an electric motor and/or generator by lubricating the transmission system with a lubricating oil composition, the lubricating oil composition comprising:

a. a major amount of an oil of lubricating viscosity having a kinematic viscosity at 100 °C in a range of 1.5 mm2/s to 20 mm2/s;
b. an sulfur-based additive including a thiadiazole and a sulfurized polyolefin of formula (I):



(I)

where R1 is hydrogen or methyl, and R2 is a C8-C40 hydrocarbyl group, the sulfur-based additive providing sulfur to the lubricating oil composition in an amount of 0.01wt. % to 0.2 wt. %, based on the total weight of the lubricating oil composition;

c. a phosphorus compound; and
d. an ashless polyisobutenyl succinimide-based dispersant containing boron.

6. The method of claim 5, wherein the sulfur-based additive consists of the thiadiazole and the sulfurized polyolefin of formula (I).

7. The method of claim 5 or the lubricating oil composition of claim 1, wherein the sulfurized polyolefin of formula (I) provides the lubricating oil composition with a sulfur content of 0.01 wt. % to 0.2 wt. %, based on the total weight of the lubricating oil composition.

8. The method of claim 5 or the lubricating oil composition of claim 1, wherein the thiadiazole provides the lubricating oil composition with a sulfur content of 0.005 wt. % to 0.2 wt. %, based on the total weight of the lubricating oil composition.

9. The method of claim 5 or the lubricating oil composition of claim 1, wherein the lubricating oil composition includes sulfur in a total amount of 0.01 wt. % to 0.2 wt. %, based on the total weight of the lubricating oil composition.

10. The method of claim 5 or the lubricating oil composition of claim 1, wherein the lubricating oil composition contains less than 50 ppm of metals and has a volume resistivity greater than 1.0×10^9 Ω at 80° C.

11. The method of claim 5 or the lubricating oil composition of claim 1, wherein the phosphorus compound includes at least one of a phosphate, a phosphate ester, an amine salt of a phosphate ester, a phosphonate a phosphonate ester, a phosphite, and a phosphite ester.

12. The method of claim 5 or the lubricating oil composition of claim 1, wherein the lubricating oil composition includes phosphorus in a total amount of 0.005 wt. % to 0.2 wt. %, based on the total weight of the lubricating oil composition.

13. The method of claim 5 or the lubricating oil composition of claim 1, wherein the ashless polyisobutenyl succinimide-based dispersant includes boron in an amount of 0.003 wt. % to 0.02 wt. % and nitrogen in an amount of 0.005 wt. % to 0.10 wt. %, based on the total weight of the ashless polyisobutenyl succinimide-based dispersant.

14. The method of claim 5, wherein the lubricating oil composition includes a corrosion inhibitor containing nitrogen; and the oil of lubricating viscosity includes a Group II base stock and a Group III base stock.

15. The method of claim 5, wherein the lubricating oil composition includes a corrosion inhibitor comprising a tolyltriazole derivative with an alkyl amine moiety, and wherein the oil of lubricating viscosity includes a Group II base stock and a Group III base stock.