PROCESSES FOR PREPARING ESTOLIDE BASE OILS AND OLIGOMERIC COMPOUNDS THAT INCLUDE CROSS METATHESIS

CROSS-REFERENCE TO RELATED APPLICATIONS

[001] This application claims the benefit under 35 U.S.C. § 119(e) of U.S. Provisional Patent Application No. 61/577,598, filed December 19, 2011, and U.S. Provisional Patent Application No. 61/610,376, filed March 13, 2012, both of which are incorporated herein by reference in their entireties for all purposes.

FIELD

[002] The present disclosure relates to estolide base oils, oil stocks, lubricants, and oligomeric compounds, and methods of making the same. Exemplary processes include the use of cross metathesis.

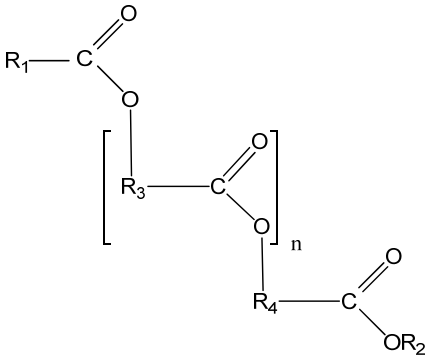
BACKGROUND

[003] Lubricant compositions typically comprise a base oil, such as a hydrocarbon base oil, and one or more additives. Estolides present a potential source of biobased, biodegradable oils that may be useful as lubricants and base stocks. In addition, certain oligomeric compounds, such as estolides prepared from fatty acids having terminal sites of unsaturation, may provide biodegradable high-viscosity oils and other polymeric-type compounds.

SUMMARY

[004] Described herein are estolide compounds and compositions, oligomeric compounds, and methods of making the same. In certain embodiments, such compounds and compositions may be useful as base oils and lubricants. Also described herein are oligomeric/polymeric compounds and compositions that may be useful as high-viscosity oils or film-like materials and coatings.

[004a] In one aspect of the present disclosure, there is provided at least one compound according to Formula III:



Formula III

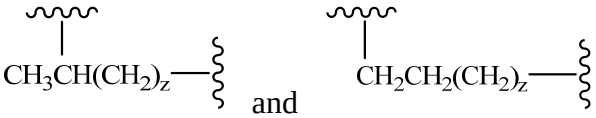
wherein

n is an integer selected from 0 to 20;

R_1 is an unsubstituted, branched or unbranched C_1 to C_{22} alkyl that is saturated or unsaturated;

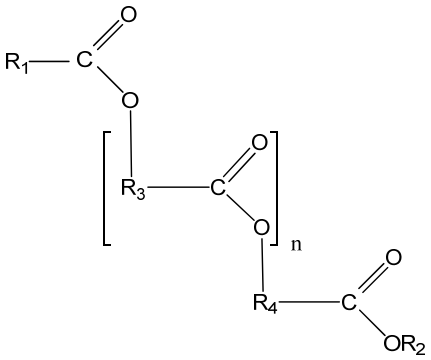
R_2 is hydrogen; and

R_3 and R_4, independently for each occurrence, are selected from



wherein R_3 and R_4 are unsubstituted and z is 7.

[004b] In another aspect of the present disclosure, there is provided at least one compound according to Formula III:



Formula III

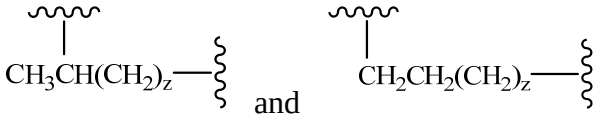
wherein

n is an integer selected from 1 to 20;

R_1 is an unsubstituted, branched or unbranched C_1 to C_{22} alkyl that is saturated or unsaturated;

R_2 is an unsubstituted, branched or unbranched C_1 to C_{22} alkyl that is saturated or unsaturated; and

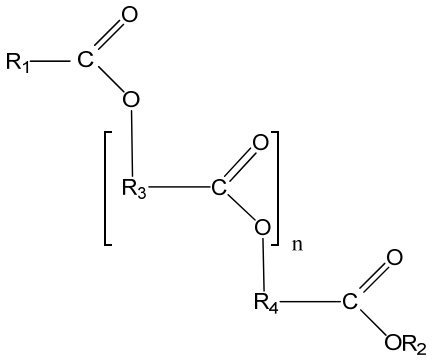
R_3 and R_4, independently for each occurrence, are selected from



and

wherein R_3 and R_4 are unsubstituted and z is, independently for each occurrence, an integer selected from 7 and 8.

[004c] In a further aspect of the present disclosure, there is provided at least one compound according to Formula III:



Formula III

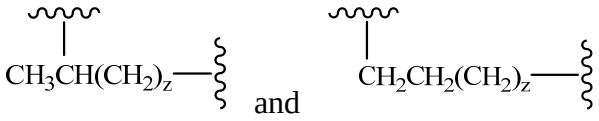
wherein

n is an integer selected from 0 to 20;

R_1 is an unsubstituted, branched or unbranched C_7 to C_{17} alkyl that is saturated or unsaturated;

R_2 is an unsubstituted, branched or unbranched C_1 to C_{22} alkyl that is saturated or unsaturated; and

R_3 and R_4, independently for each occurrence, are selected from

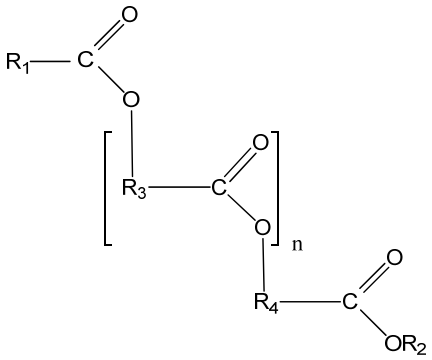


wherein R_3 and R_4 are unsubstituted and z is an integer selected from 7 and 8.

[004d] In another aspect of the present disclosure, there is provided a composition comprising:

an additive selected from at least one of a polyalphaolefin, a polyalkylene glycol, a mineral oil, a pour point depressant, a viscosity modifier, an anti-corrosive, an antiwear agent, a detergent, a dispersant, a colorant, an antifoaming agent, or a demulsifier; and

at least one compound selected from compounds of Formula III:



Formula III

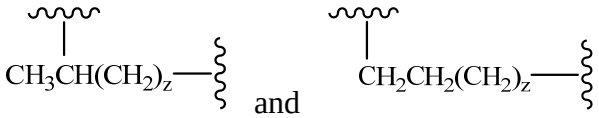
wherein

n is an integer selected from 0 to 20;

R_1 is an unsubstituted, branched or unbranched C_1 to C_{22} alkyl that is saturated or unsaturated;

R_2 is selected from hydrogen and an unsubstituted, branched or unbranched C_1 to C_{22} alkyl that is saturated or unsaturated; and

R_3 and R_4, independently for each occurrence, are selected from



wherein R_3 and R_4 are unsubstituted and z is, independently for each occurrence, an integer selected from 7 and 8.

[005] In certain embodiments are described at least one compound of Formula I:

