CLAIMS

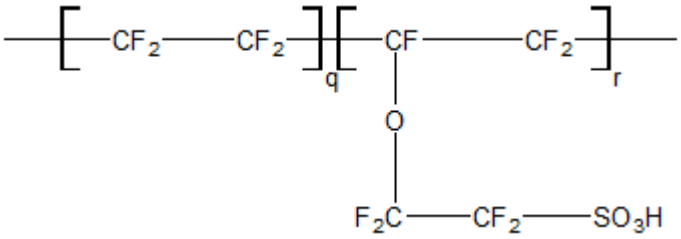
1. A method for preparing a composition of estolides that comprises reacting at least one unsaturated compound selected from among unsaturated fatty acids containing from 10 to 20 carbon atoms; with at least one saturated fatty acid containing from 4 to 18 carbon atoms; in the presence of at least one catalyst comprising at least one sulphonic acid functional group;
   the said method including no vacuum distillation step thereby making it possible to separate the monoestolides from the polyestolides.

2. The method according to claim 1, that does not include the successive steps (i) and (ii), where (i) is the mixing of 1 equivalent of 2-ethylhexyl oleate with 6 equivalents of lauric acid in the presence of 0.25 equivalent of triflic acid; and (ii) is the heating at 60°C for 24 hours of the mixture obtained in step (i).

3. The method according to claim 1 or 2, wherein the unsaturated compound is selected from among unsaturated fatty acids containing from 11 to 20 carbon atoms.

4. The method according to claim 3, further comprising an esterification step for esterifying the composition of estolides obtained, preferably by reaction of the estolides with an alcohol containing from 1 to 16 carbon atoms.

5. The method according to any one of claims 1 to 4, wherein the catalyst is selected from:
   - a catalyst having the formula RSO_3H, optionally supported, where R is a hydrogen atom or a linear, branched or cyclic hydrocarbon radical having from 1 to 18 carbon atoms, optionally substituted by one or more heteroatoms, for example of nitrogen, fluorine, oxygen, sulfur, silicon type; and
   - a catalyst in the form of a polymer having the formula (1):
   [Chem 1]



   wherein q and r represent independently of each other a number ranging from 1 to 15.

6. The method according to any one of claims 1 to 5, wherein the reaction is carried out at a temperature ranging from 20 to 90°C, preferably from 30 to 80°C, more preferably from 40 to 70°C.

7. The method according to any one of claims 1 to 6, wherein the molar ratio of the unsaturated compound/saturated fatty acid ranges from 1/10 to 1/1, preferably from 1/8 to 1/4.

8. The method according to any one of claims 1 to 7, wherein the molar ratio of the unsaturated compound/catalyst ranges from 1/0.1 to 1/1, preferably from 1/0.15 to 1/0.5.

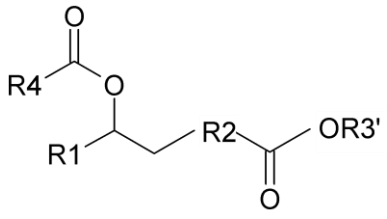
9. An estolide composition that is obtainable by the method according to one of claims 1 to 8, the composition comprising, relative to the total weight of the estolides:
   - from 65 to 99.9% by weight of monoestolide(s) in the form of acid and/or ester; and
   - from 0.1 to 35% by weight of polyestolide(s) in the form of acid and/or ester,

the estolide composition having an iodine number less than or equal to 13 g/100g of iodine.

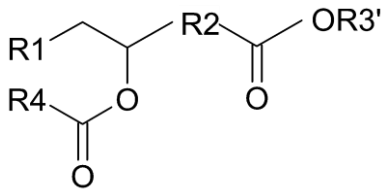
10. The estolide composition according to claim 9, comprising, relative to the total weight of the estolides:
    - from 65 to 99.9% by weight, preferably from 70 to 95% by weight, more preferably from 75 to 90% by weight, of monoestolides replying to the formula (8) and/or to the formula (9); and
    - from 0.1 to 35% by weight, preferably from 5 to 30% by weight, more preferably from 10 to 25% by weight, of polyestolides replying to the formula (10) and/or to the formula (11);

    where

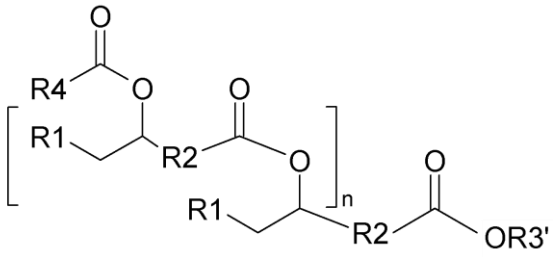
    [Chem 8]:



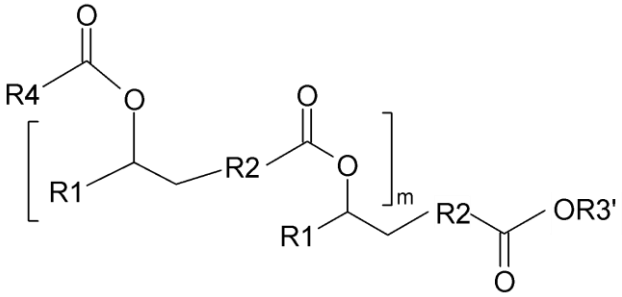
[Chem 9]:



[Chem 10]:



[Chem 11]:



wherein:

R1 represents a hydrogen atom or a monovalent alkyl radical, either linear or branched, containing from 1 to 16 carbon atoms, preferably from 4 to 14 carbon atoms; advantageously R1 represents a hydrogen atom or a linear alkyl containing from 5 to 12 carbon atoms;

R2 represents a divalent alkylene radical, either linear or branched, containing from 1 to 16 carbon atoms; preferably a linear or branched alkylene containing from 3 to 13 carbon atoms, advantageously a linear alkylene containing from 4 to 9 carbon atoms;

it being understood that the sum of the number of carbon atoms of R1 and R2 ranges from 7 to 17, preferably from 8 to 17;

R4 represents a monovalent alkyl radical, either linear or branched, containing from 5 to 17 carbon atoms; preferably a linear or branched alkyl containing from 6 to 12 carbon atoms; advantageously a linear alkyl containing from 7 to 12 carbon atoms;

R3' is a hydrogen atom or a monovalent alkyl radical, either linear or branched, containing from 1 to 16 carbon atoms; preferably from 1 to 12 carbon atoms, advantageously from 1 to 10 carbon atoms;

n and m are independent of each other and other than zero, preferably n and m range from 1 to 4.

11. The estolide composition according to one of claims 8 to 10, having an iodine number less than or equal to 12 g/100 g of iodine, advantageously less than or equal to 10 g/100 g of iodine.

12. The estolide composition according to one of claims 9 to 11, wherein the estolide composition does not comprise estolides obtained by reacting 1 equivalent of 2-ethylhexyl oleate with 6 equivalents of lauric acid in the presence of 0.25 equivalent of triflic acid.

13. The use of the estolide composition according to any one of claims 8 to 12, as base oil in a lubricating composition, the said estolides of the estolide composition being in ester form.

14. A lubricating composition comprising the estolide composition according to any one of claims 8 to 12 and at least one base oil other than the estolides and/or at least one additive.