Claims

1. Polyesters obtained from internal epoxides that are derived from internal olefins comprising 10 to 24 carbon atoms, or from diols that are derived from that internal epoxides, and saturated linear aliphatic dicarboxylic acids comprising 5 to 13 carbon atoms, wherein the polyesters have a melting point of equal to or below -15°C.

2. The polyesters according to claim 1, wherein the internal olefin comprises not more than 30 mol%, preferably not more than 20 mol%, of double bonds being in the alpha-position.

3. The polyesters according to claim 1 or 2, wherein the internal olefin comprises 12 to 20 carbon atoms.

4. The polyesters according to claim 1 or 2, wherein the internal olefin comprises 14 to 18 carbon atoms.

5. The polyesters according to claim 1 or 2, wherein the dicarboxylic acid is a saturated linear aliphatic dicarboxylic acid selected from the group consisting of glutaric acid (pentanedioic acid), 2,2-dimethylglutaric acid (2,2-dimethylpentanedioic acid), adipic acid (hexanedioic acid), 2,4,4-trimethyladipic acid (2,4,4-trimethylhexanedioic acid), pimelic acid (heptanedioic acid), suberic acid (octanedioic acid), azelaic acid (nonanedioic acid), sebacic acid (decanedioic acid), undecanedioic acid, dodecanedioic acid, brassylic acid (tridecanedioic acid) and mixtures thereof; preferred are azelaic acid (nonanedioic acid), sebacic acid (decanedioic acid), dodecanedioic acid and mixtures thereof.

6. The polyesters according to claim 1 or 2, wherein the polyesters have a melting point of equal to or below -25°C.

7. The polyesters according to claim 1 or 2, wherein the polyesters do not have any melting point.

8. The polyesters according to claim 1 or 2, wherein the polyesters have a glass transition temperature of equal to or below -50°C.

9. The polyesters according to claim 1 or 2, having a number-average molecular weight M_n in the range of 1,000 to 15,000 g/mol, determined by size exclusion chromatography (SEC) using polymethylmethacrylate standards.

10. The polyesters according to claim 1 or 2, having a KV100 in the range of 40 to 2000 cSt.

11. The polyesters according to claim 1 or 2, having a KV100 in the range of 100 to 1000 cSt.

12. The polyesters according to claim 1 or 2, wherein the molar ratio of carbon to oxygen, calculated by summing up the number of carbon atoms present in the diol and in the diacid monomers and dividing the resulting numbers by four as being the number of oxygen atoms in the resulting diester unit, is in the range of 4:1 to 12:1.

13. Use of the polyesters according to any one of claims 1 to 12 as base oils in lubricant formulations, especially in gear oil formulations.

14. Lubricating composition, comprising:

(A) 20 to 60% by weight of at least one polyester prepared from internal epoxides that are derived from internal olefins comprising 10 to 24 carbon atoms, or from diols that are derived from that internal epoxides, and saturated linear aliphatic diacids comprising 5 to 13 carbon atoms, wherein the polyesters have a melting point of equal to or below -15°C;

(B) 40 to 80% by weight of a base oil selected from the group consisting of API Group II oils, API Group III oils, API Group IV oils, and mixtures thereof; and

(C) 0 to 5% by weight of one or more additives,

based on the total weight of the lubricating composition.

15. Lubricating composition according to claim 14, wherein the internal olefin of component (A) comprises 12 to 20 carbon atoms.

16. Lubricating composition according to claim 14, wherein the internal olefin of component (A) comprises 14 to 18 carbon atoms.

17. Lubricating composition according to claim 14, wherein the one or more further additives (C) are selected from the group consisting of pour point depressants, dispersants, defoamers, detergents, demulsifiers, antioxidants, antiwear additives, extreme pressure additives, friction modifiers, anticorrosion additives, dyes and mixtures thereof.

18. Method for preparing the polyesters according to any one of claims 1 to 12, the process comprising the steps of:

(a) isomerizing an alpha-olefin comprising 10 to 24 carbon atoms to an internal olefin;

(b) epoxidizing the internal olefin retrieved under step (a);

(c1) reacting the internal epoxide retrieved under step (b) with a saturated linear aliphatic dicarboxylic acid comprising 5 to 13 carbon atoms, or

(c2) transferring the internal epoxide retrieved under step (b) to the corresponding diol and reacting the diol with a dicarboxylic acid comprising 5 to 13 carbon atoms; and

(d) isolating the desired polyester.

19. The method according to claim 18, wherein the alpha-olefin used in step (a) comprises 12 to 20 carbon atoms.

20. The method according to claim 18, wherein the alpha-olefin used in step (a) comprises 14 to 18 carbon atoms.