Claims

1. Use of polyalkyl acrylates, consisting of
100% by weight of branched C_{8-10}-alkyl acrylates,
wherein the weight-average molecular weight is in the range of 7,000 to 25,000 g/mol, the polydispersity index M_w/M_n is in the range of 1.5 to 3.5 and the residual monomer content is 0.1% by weight or lower,
as base oils in lubricant formulations, especially in industrial gear oil formulations.

2. The use according to claim 1, wherein the C_{8-10}-alkyl acrylate is selected from the group consisting of 2-ethylhexyl acrylate and 2-propylheptyl acrylate.

3. The use according to claim 1 or 2, wherein the molar ratio of carbon to oxygen in the polyalkyl acrylates is in the range of 4.5:1 to 7.5:1, preferably in the range of 5:1 to 7:1, and more preferably in the range of 5.5:1 to 6.5:1.

4. Base oil composition, comprising:
(A) 70 to 95% by weight of at least one polyalkyl acrylate, consisting of
100% by weight of branched C_{8-10}-alkyl acrylates,
wherein the weight-average molecular weight is in the range of 7,000 to 25,000 g/mol, the polydispersity index M_w/M_n is in the range of 1.5 to 3.5 and the residual monomer content is 0.1% by weight or lower; and
(B) 5 to 30% 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,
based on the total weight of the base oil composition.

5. Base oil composition according to claim 4, wherein the C_{8-10}-alkyl acrylate is selected from the group consisting of 2-ethylhexyl acrylate and 2-propylheptyl acrylate.

6. Base oil composition according to claim 4, wherein the C_{8-10}-alkyl acrylate is ethylhexyl acrylate.

7. Base oil composition according to claim 4 or 5, wherein the molar ratio of carbon to oxygen in the polyalkyl acrylates is in the range of 4.5:1 to 7.5:1, preferably in the range of 5:1 to 7:1, and more preferably in the range of 5.5:1 to 6.5:1.

8. Use of a base oil composition according to any one of claims 4 to 7 as industrial gear oil.

9. Polyalkyl acrylates, consisting of

100% by weight of branched C_{8-10}-alkyl acrylates,

wherein the weight-average molecular weight is in the range of 7,000 to 25,000 g/mol, the polydispersity index M_w/M_n is in the range of 1.5 to 3.5 and the residual monomer content is 0.1% by weight or lower.

10. Polyalkyl acrylates according to claim 9, wherein the C_{8-10}-alkyl acrylate is selected from the group consisting of 2-ethylhexyl acrylate and 2-propylheptyl acrylate.

11. Polyalkyl acrylates according to claim 9 or 10, wherein the C_{8-10}-alkyl acrylate is ethylhexyl acrylate.

12. Polyalkyl acrylates according to claim 9 or 10, wherein the molar ratio of carbon to oxygen in the polyalkyl acrylates is in the range of 4.5:1 to 7.5:1, preferably in the range of 5:1 to 7:1, and more preferably in the range of 5.5:1 to 6.5:1.

13. Lubricating composition, comprising:

(A) 20 to 60% by weight of at least one polyalkyl acrylate, consisting of

100% by weight of branched C_{8-10}-alkyl acrylates,

based on the total weight of the polyalkyl acrylate,

wherein the weight-average molecular weight is in the range of 7,000 to 25,000 g/mol, the polydispersity index M_w/M_n is in the range of 1.5 to 3.5 and the residual monomer content is 0.1% by weight or lower;

(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.

14. Lubricating composition according to claim 13, 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.

15. Process for preparing polyalkyl acrylates, consisting of

100% by weight of branched C_{8-10}-alkyl acrylates,

wherein the weight-average molecular weight is in the range of 7,000 to 25,000 g/mol, the polydispersity index M_w/M_n is in the range of 1.5 to 3.5 and the residual monomer content is 0.1% by weight or lower, the process comprising the steps of:

(i) charging a reaction vessel with a base oil;

(ii) heating the base oil of step (i) to a reaction temperature of 130°C to 170°C;

(iii) constantly feeding a mixture of branched C_{8-10}-alkyl acrylates and 0.1 to 1.2% by weight of an initiator, based on the amount of branched C_{8-10}-alkyl acrylates, to the reaction vessel over a time of 120 to 240 minutes;

(iv) optionally stirring the reaction mixture obtained under step (iii) for another 50 to 90 minutes; and

(v) cooling the reaction mixture obtained under step (iv) to an ambient temperature and obtaining the desired polyalkyl acrylate.

16. Process according to claim 15, wherein the initiator used in step (iii) is selected from the group consisting of AIBN, 1,1-azobiscyclohexanecarbonitrile, methyl ethyl ketone peroxide, acetylacetone peroxide, dilauryl peroxide, tert-butyl per-2-ethylhexanoate, ketone peroxide, tert-butyl peroctoate, methyl isobutyl ketone peroxide, cyclohexanone peroxide, dibenzoyl peroxide, tert-butyl peroxybenzoate, tert-butyl peroxyisopropylcarbonate, 2,5-bis(2-ethylhexanoylperoxy)-2,5-dimethylhexane, tert-butyl peroxy-2-ethylhexanoate, tert-butyl peroxy-3,5,5-trimethylhexanoate, dicumyl peroxide, 1,1-bis(tert-butylperoxy)cyclohexane, 1,1-bis(tert-butylperoxy)-3,3,5-trimethylcyclohexane, cumyl hydroperoxide, tert-butyl hydroperoxide, bis(4-tert-butylcyclohexyl) peroxydicarbonate, mixtures of two or more of the aforementioned compounds with one another, and mixtures of the aforementioned compounds with unspecified compounds which can likewise form free radicals.